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ABSTRACT OF

A Presidential Address

ON

THE DYNAMIC SIDE OF BIOCHEMISTRY.

Delivered at Birmingham on Thursday, Sept. 11th, to the Physiological Section of the British Association for the Advancement of Science,

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THE DIVORCE BETWEEN CHEMISTRY AND BIOLOGY.

GENTLEMEN,—In the year 1837 Justus Liebig, whom we may rightly name the father of modern animal chemistry, presented a report to the Chemical Section of the British Association, then assembled at Liverpool. The technical side of this report dealt with the products of the decomposition of uric acid, with which I am not at the moment concerned, but it concluded with remarks which, to judge from other contemporary writings of Liebig, would have been more emphatic had the nature of his brief communication permitted. Liebig had a profound belief that in the then new science of organic chemistry biology was to find its greatest aid to progress, and his enthusiastic mind was fretted by the cooler attitude of others. In the report I have mentioned he called upon the chemists of this country to take note of what was in the wind, and while complimenting British physiologists and biologists upon their own work, urged upon them the immediate need of combining with the chemists. Ten years later Liebig had still to write with reference to chemical studies: "Der Mann welcher in der Thierphysiologie wie Saussure in der Pflanzenphysiologie die ersten und wichtigsten Fragen zur Aufgabe seines Lebens macht, fehlt noch in dieser Wissenschaft."[1] Much later he was still making the same complaint. As a matter of fact, the combination of chemistry with biology, in the full and abundant sense that Liebig's earlier enthusiasm had pictured as so desirable, never happened in any country within the limits of his own century, while in this country, up to the end of that century, it can hardly be said to have happened at all. But the regrettable divorce between these two aspects of science has been so often dwelt upon that you will feel no wish to hear it treated historically, and perhaps even any emphasis given to it now may seem out of place, since on the continent, and notably in America, the subject of biochemistry (with its new and not very attractive name) has come with great suddenness into its kingdom. Even in this country the recent successful formation of a biochemical society gives sure evidence of a greatly increased interest in this borderland of science. Yet I am going to ask you to listen to some remarks which are a reiteration of Liebig's appeal to this Association three-quarters of a century ago.

THE DEMAND FOR THE SERVICES OF TRAINED BIOCHEMISTS.

For one can, I think, honestly say that it is yet a rare thing in this country to meet a professed biologist, even among those unburdened either with years or traditions, who has taken the trouble so to equip himself in organic chemistry as to understand fully an important fact of metabolism stated in terms of structural formulæ. The newer science of physical chemistry has made a more direct appeal to the biological mind. Its results are expressed in more general terms and the bearings of its applications are perhaps more obvious, especially at the present moment. This fact increases the danger of a further neglect in biology of the organic structural side of chemistry, upon which, nevertheless, the whole modern science of intermediary metabolism depends. On the other hand, I think one may say that there are only a few among the present leaders of chemical thought in our midst who have set themselves to appraise with sympathy the drift of biological processes or the nature of the problems that biologists have before them. Anyone wishing to see the number of biochemical workers increased might therefore with equal justice appeal to the teachers of biology or to the teachers of chemistry for greater sympathy with the borderland. It is a moot point indeed as to which is the better side for that borderland to recruit its workers from.

But on the whole it is easier for the intelligent adult mind to grasp new problems than to learn a new technique. It is better that youth should be spent in acquiring the latter. That is why, though I admit that it would have been more obviously to the point if made some ten years ago, I feel justified in repeating to-day the appeal of Liebig to the leading chemists of this country, in the hope that they may see their way to direct the steps of more of their able students into the path of biochemistry. I have been specially tempted to do this, rather than to speak upon some of many subjects which would have interested this section more, for a very practical reason. I have been in a position to review the current demand of various institutions, home and colonial, for the services of trained biochemists, and can say, I think with authority, that the demand will rapidly prove to be in excess of the supply. It will be a pity if the generation of trained chemists now growing up in this country should not share in the restoration of this balance. You certainly have the right to tell me that I ought, under the circumstances, to be addressing another section; but it may be long before any member of my cloth will have the opportunity of appealing to that section from the position of advantage that I occupy here. I believe you will forgive the particular trajectory of my remarks, because I am sure you will sympathise with their aim. Moreover, I have some hope that the considerations upon which I shall chiefly base my appeal will have some interest for members of this section as well as for the chemist. My main thesis will be that in the study of the intermediate processes of metabolism we have to deal, not with complex substances which elude ordinary chemical methods, but with simple substances undergoing comprehensible reactions. By simple substances I mean such as are of easily ascertainable structure and of a molecular weight within a range to which the organic chemist is well accustomed. I intend also to emphasise the fact that it is not alone with the separation and identification of products from the animal that our present studies deal, but with their reactions in the body, with the dynamic side of biochemical phenomena.

PROGRESS IN ANIMAL CHEMISTRY.

I have made it my business during the last year or two to learn, by means of indirect and most diplomatic inquiries, the views held by a number of our leading organic chemists with respect to the claims of animal chemistry. I do not find any more the rather pitying patronage for an inferior discipline, and certainly not that actual antagonism which fretted my own youth, but I do find still very widely spread a distrust of the present methods of the biochemist, a belief that much of the work done by him is amateurish and inexact. What is much more important (though but a very small modicum of truth is, or ever was, in the above indictment) is the view that such faults are due to something inherent in the subject.

My desire is to point out that continuous progress, yielding facts which, by whomsoever appraised, belong to exact science, has gone on in the domain of animal chemistry from the days of Liebig until now, and that if this progress was till recently slow it was, in the main, due to a continuance of the circumstance which so troubled Liebig himself—the shortage of workers.

But we must also remember that the small band of investigators who concerned themselves with the chemistry of the animal in the latter half of the nineteenth century suffered very obviously from the fact that the channels in which chemistry as a whole was fated to progress left high and dry certain regions of the utmost importance to their subject. In three regions particularly the needs of biochemistry were insistent. The colloid state of matter dominates the *milieu* in which vital processes progress, but notwithstanding the stimulating work of Graham, the pure chemist of the last century consistently left colloids on one side with a shudder of distaste. Again, we have come to recognise that the insidious influence of catalysts is responsible for all chemical change as it occurs in living matter, but for many years after Berzelius the organic chemist gave to the subject of catalysis very cursory attention, fundamental though it be. Lastly, every physiological chemist has to realise that among his basal needs is that of accurate methods for the

[1] Annalen der Chemie und Pharmacologie, vol. lxii., p. 257, 1847.

estimation of organic substances when they are present in complex mixtures. But the organic chemist of the nineteenth century did not develop the art of analysis on these lines. Of the myriad substances, natural or artificial, known to him at the most a few score could be separated quantitatively from mixtures, or estimated with any accuracy. It was a professional or commercial call rather than scientific need which evolved such processes as were available, so that this side of chemical activity developed only on limited and special lines.

All these circumstances were, of course, inevitable. Organic chemistry in Liebig's later years was concerned with laying its own foundations as a pure science, and for the rest of the century with building a giant, self-contained edifice upon them. The great business of developing the concepts of molecular structure and the wonderful art of synthesis were so absorbing as to leave neither leisure nor inclination for extraneous labours. But it is easy to recognise that near the beginning of the present century a sense of satiety had arisen in connexion with synthetic studies carried out for their own sake. Workers came to feel that, so far as the fundamental theoretical aspects of chemistry were concerned, that particular side of organic work had played its part. In numerous centres, instead of only in a few, quite other aspects of the science were taken up—in particular, the study of the dynamic side of its phenomena. The historian will come to recognise that a considerable revolution in the chemical mind coincided roughly with the beginning of this century. Among the branches which are fated to benefit by this revolution—it is to be hoped in this country as well as others—is the chemistry of the animal.

But I would like to say that I do not find, on reading the contributions to science of those who, as professed physiological chemists, ploughed lonely furrows in the last century, any justification for the belief that the work done by them was amateurish or inexact; no suggestion that anything inherent in the subject is prone to lead to faults of the kind. Truly these workers had to share ignorance which was universal, and sometimes, compelled by the urgency of certain problems, had perforce to do their best in regions that were dark. But they knew their limitations here as well as their critics did, and relied for their justification upon the application of their results, which was often not understood at all by their critics.

There is little doubt, for instance, that it was the earlier attempts of various workers to fractionate complex colloid mixtures that led to the cynical statement that "*Thierchemie* is *Schmierchemie*." But the work thus done, even such work as Kühne's upon the albumoses and peptones, had important bearings, and led indirectly to the acquirement of facts of great importance to physiology and pathology.

In connexion with enzyme catalysis, the work done at this time by physiological chemists was in the main of a pioneer character, but it was urgently called for and had most useful applications. By the end of the century it had become of great importance.

As for analytical work involving a separation of complex organic mixtures the biochemist of the last century was in this ahead of the pure organic chemist, as the development of urinary analysis if considered alone will show. In countless directions the acquirement of exact knowledge concerning animal chemistry has been continuous.

THE CHEMICAL RESPONSES OF THE TISSUES.

[Here Professor Gowland Hopkins drew attention to certain of the various steps by which we have arrived at a knowledge of the synthetic powers of the animal body. Commencing with the original discovery of Andrew Ure that an increased excretion of hippuric acid followed upon the exhibition of benzoic acid, he detailed the experiments of Bunge and Schmiedeberg, and alluded to the question of how far the body can extend its supply of glycine when stimulated by increasing doses of benzoic acid. He next dealt with the researches of Baumann and the syntheses where the sulphur group plays a part, in which substances are so treated in the body as to reappear in conjugation with protein derivatives; with the syntheses in which the substance supplied by the body is derived, not from protein, but from carbohydrate; with the study of the fate of camphor in the body; and with the methylation undergone by certain compounds. He continued as follows:—]

The full significance of all such happenings will not be understood unless it be remembered that a nice adjustment of molecular structure is in many cases necessary to prepare the foreign substance for synthesis. Preliminary regulated oxidations or reductions may occur so as to secure, for example, the production of an alcoholic or phenolic hydroxyl group, which then gives the opportunity for condensation which was otherwise absent.

I have touched only on the fringes of this domain. The body of knowledge available concerning it has not been won systematically, and the fate of a multitude of other types of organic substances remains for investigation. The known facts have, one feels, an academic character in the view of the physiologist, and even in that of the pharmacologist, to whom we owe most of our knowledge about them. But, in my opinion, the chemical response of the tissues to the chemical stimulus of foreign substances of simple constitution is of profound biological significance. Apart from its biological bearings as the simplest type of immunity reaction, it throws vivid light, and its further study must throw fresh light on the potentialities of the tissue laboratories.

In a brilliant address delivered before the Faculty of Medicine of the University of Leeds, Lord Moulton likened the process of recovery in the tissues after bacterial invasion to the generation of forces which establish what is known to the naval architect as the "righting couple." This grows greater the greater the displacement of a ship, and finally may become sufficient to overpower the forces tending to make her heel over. It is surely striking to realise that the establishment of the "righting couple" which brings the tissue cell back to equilibrium after the disturbances due to the intrusion of simple molecules calls for such a complex of chemical events, events which ultimately result in the modification of the disturbing substance and its extrusion from the tissues concerned in a form less noxious to the body as a whole.

Oxidation, reduction, desaturation, alkylation, and condensation, and any or all of these processes, may be brought *de novo* into play as the result of the intrusion of a new molecule into reactions which were in dynamic equilibrium. It is clear that chemical systems capable of so responding to what may be termed specific chemical stimuli must not be neglected by any student of chemical dynamics. The physiologist has for many years been engaged upon careful analyses of the mechanical and electric responses to stimulation. In the phenomena before us we find "responses" which are equally fundamental. If we do not study them exhaustively we shall miss an important opportunity for throwing light upon the nature of animal tissues as chemical systems.

One reason which has led the organic chemist to avert his mind from the problems of biochemistry is the obsession that the really significant happenings in the animal body are concerned in the main with substances of such high molecular weight and consequent vagueness of molecular structure as to make their reactions impossible of study by his available and accurate methods. There remains, I find, pretty widely spread, the feeling—due to earlier biological teaching—that, apart from substances which are obviously excreta, all the simpler products which can be found in cells or tissues are as a class mere dejecta, already too remote from the fundamental biochemical events to have much significance. So far from this being the case, recent progress points in the clearest way to the fact that the molecules with which a most important and significant part of the chemical dynamics of living tissues is concerned, are of a comparatively simple character. The synthetic reactions which we have already considered surely prepare us for this view; but it may be felt that, however important, they represent abnormal events, while the study of them has been largely confined to determining the end-products of change. Let me now turn to normal metabolic processes and to intermediary reactions.

NORMAL METABOLISM AND INTERMEDIARY REACTIONS.

We know first of all that the raw material of metabolism is so prepared as to secure that it shall be in the form of substances of small molecular weight; that the chief significance of digestion, indeed, lies in the fact that it protects the body from complexes foreign to itself. Abderhalden has ably summarised the evidence for this, and has shown us also that, so far as the known constituents of our dietaries are concerned, the body is able to maintain itself when these are

supplied to it wholly broken down into simple *bausteine*, any one of which could be artificially synthesised with the aid of our present knowledge. Dealing especially with the proteins, we have good reason to believe that the individual constituent amino-acids, and not elaborate complexes of these, leave the digestive tract, while Folin, Van Slyke, and Abel have recently supplied us with suggestive evidence for the fact that the individual amino-acids reach the tissues as such and there undergo change. But still more important, when things are viewed from my present standpoint, is the fact that recent work gives clear promise that we shall ultimately be able to follow, on definite chemical lines, the fate in metabolism of each amino-acid individually; to trace each phase in the series of reactions which are concerned in the gradual breakdown and oxidation of its molecule. Apart from the success to which it has already attained, the mere fact that the effort to do this has been made is significant. To those at least who are familiar with the average physiological thought of 30 years ago, it will appear significant enough. So long as there were any remains of the instinctive belief that the carbonic acid and urea which leave the body originate from oxidations occurring wholly in the vague complex of protoplasm, or at least that any intermediate products between the complex and the final excreta could only be looked for in the few substances that accumulate in considerable amount in the tissues (for instance, the creatin of muscle), the idea of seriously trying to trace within the body a series of processes which *begin* with such simple substances as tyrosin or leucin was as foreign to thought as was any conception that such processes could be of fundamental importance in metabolism. However vaguely held, such beliefs lasted long after there was justification for them; their belated survival was due, it seems to me, to a certain laziness exhibited by physiological thought when it trenched on matters chemical; they disappeared only when those accustomed to think in terms of molecular structure turned their attention to the subject. But it should be clearly understood that the progress made in these matters could only have come through the work and thought of those who combined with chemical knowledge trained instinct and feeling for biological possibilities.

Methods of Investigation.

Our knowledge of the fate of amino-acids is arrived at by the combination of many ingenious methods of study. It is easy in the animal, as in the laboratory, to determine the end-products of change; but, when the end result is reached in stages, it is by no means easy to determine what are the stages, since the intermediate products may elude us. And yet the whole significance of the processes concerned is to be sought in the succession of these stages. In animal experiments directed to the end under consideration, investigators have relied first of all upon the fact that the body, though the seat of a myriad reactions and capable perhaps of learning, to a limited extent and under stress of circumstances, new chemical accomplishments, is in general able to deal only with what is customary to it. This circumstance has yielded two methods of determining the nature of intermediate products in metabolism. Considerations of molecular structure will, for instance, suggest several possible lines along which a given physiological substance may be expected to undergo change. We may test these possibilities by administering various derivatives of the substance in question. Only those which prove on experiment to be fully metabolised, or to yield derivatives in the body identical with those yielded by the parent substance, can be the normal intermediate products of its metabolism. All others may be rejected as not physiological. In a second method dependent upon this eclecticism of the body, substances are administered which so far differ from the normal that, instead of suffering a complete breakdown, they yield some residual derivative which can be identified in the excreta, and the nature of which will throw light upon the chemical mechanism which has produced it. For instance, a substance with a resistant (because abnormal) ring structure, but possessing a normal side chain, may be used to demonstrate how the side chain breaks down. Again, we may sometimes obtain useful information by administering a normal substance in excessive amounts, when certain intermediate products may appear in the excreta. Another most profitable method of experiment is that in which the substance to be studied is submitted to the influence of isolated organs instead of to that of the whole animal. Under these conditions, a series of normal reactions may go on, but with altered relative velocities, so that intermediate products accumulate; or again when, as may happen, the successive changes wrought upon a substance by metabolism occur in different organs of the body, this use of isolated organs enables us to dissect, as it were, the chain of events. Extraordinarily profitable have been the observations made upon individuals suffering from those errors of metabolism which Dr. Garrod calls "metabolic sports, the chemical analogues of structural malformations." In these individuals Nature has taken the first essential step in an experiment by omitting from their chemical structure a special catalyst which at one point in the procession of metabolic chemical events is essential to its continuance. At this point there is arrest, and intermediate products come to light. Use of this ready-made experimental material has added greatly to our knowledge of intermediate metabolism. Admirable use, too, has been made of the somewhat similar conditions presented by diabetes, clinical and experimental. Every day our knowledge of the dynamics of the body grows upon these lines.

The Direct Method of Attack.

I know that the history of all these efforts is familiar to you, but I am concerned to advertise the fact that our problems call for ingenuity of a special sort, and to point out that an equipment in chemical technique alone would not have sufficed for the successful attack which has been made upon them. But I am even more concerned to point out that the direct method of attack has been too much neglected, or has been in the hands of too few; I mean the endeavour to separate from the tissues further examples of the simpler products of metabolic change, no matter how small the amount in which they may be present; an endeavour which ought not to stop at the separation and identification of such substances, but to continue till it has related each one of them to the dynamic series of reactions in which each one is surely playing a part. The earliest attempts at tracing the intermediate processes of metabolism looked for information to the products which accumulate in the tissues, but it seemed to be always tacitly assumed that only those few which are quantitatively prominent could be of importance to the main issues of metabolism. It is obvious, however, upon consideration, that the degree to which a substance accumulates is by itself no measure of its metabolic importance; no proof as to whether it is on some main line of change, or a stage in a quantitatively unimportant chemical by-path. For, if one substance be changing into another through a series of intermediate products, then, as soon as dynamical equilibrium has been established in the series (and to such equilibrium tissue processes always tend) the rate of production of any one intermediate product must be equal to the rate at which it changes into the next, and so throughout the series. Else individual intermediate products would accumulate or disappear, and the equilibrium be upset. Now the rate of chemical change in a substance is the product of its efficient concentration and the velocity constant of the particular reaction it is undergoing. Thus the relative concentration of each intermediate substance sharing in the dynamic equilibrium, or, in other words, the amount in which we shall find it at any moment in the tissue, will be inversely porportional to the velocity of the reaction which alters it. But the successive velocity constants in a series of reactions may vary greatly, and the relative accumulation of the different intermediate products must vary in the same degree. It is certain that in the tissues very few of such products accumulate in any save very small amount, but the amount of a product found is only really of significance if we are concerned with any function which it may possibly possess. It is of no significance as a measure of the quantitative importance of the dynamical events which give rise to it.

To take an instance. The substance creatin has always asserted itself in our conceptions concerning nitrogenous metabolism because of the large amount in which it is found in the muscle. It may be of importance *per se*, and abnormalities in its fate are certainly important as an indication of abnormalities in metabolism, but we must remember that the work of Gulewitsch, Krimberg, Kutscher, and others has shown us that a great number of nitrogenous basic bodies exist in muscle in minute amounts. Maybe we shall need to know about each of these all that we now know, or are laboriously trying to know, about creatin before the dynamics of basic nitrogen in muscle become clear. Fortunately for the experimenter, most of the raw materials

required for tissue analysis are easily obtainable; there is no reason save that of the labour involved why we should not work upon a ton of muscle or a ton of gland tissue.

I am certain that the search for tissue products of simple constitution has important rewards awaiting it in the future, so long as physiologists are alive to the dynamical significance of all of them. Such work is laborious and calls for special instincts in the choice of analytical method, but, as I mentioned in an earlier part of this address, I am sure that high qualifications as an analyst should be part of the equipment of a biological chemist.

[Here Professor Gowland Hopkins dealt with the results of this work upon intermediate metabolism, instancing the action of the hormones and adrenalin, and stating that the chief thing to realise is that as a result of modern research the conception of metabolism in block is, as Garrod puts it, giving place to that of metabolism in compartments. He continued:—]

THE COMPLEXITY OF BIOPLASMIC PROBLEMS.

It is from the behaviour of simple molecules we are learning our most significant lessons. Now interest in the chemical events such as those we have been dealing with may still be damped by the feeling that, after all, when we go to the centre of things, to the bioplasm, where these processes are initiated and controlled, we shall find a *milieu* so complex that the happenings there, although they comprise the most significant links in the chain of events, must be wholly obscure, when viewed from the standpoint of structural organic chemistry. I would like you to consider how far this is necessarily the case.

The highly complex substances which form the most obvious part of the material of the living cell are relatively stable. Their special characters, and in particular the colloidal condition in which they exist, determine, of course, many of the most fundamental characteristics of the cell: its definite yet mobile structure, its mechanical qualities, including the contractility of the protoplasm, and those other colloidal characters which the modern physical chemist is studying so closely. For the dynamic chemical events which happen within the cell, these colloid complexes yield a special *milieu*, providing, as it were, special apparatus and an organised laboratory. But in the cell itself, I believe, simple molecules undergo reactions of the kind we have been considering. These reactions, being catalysed by colloidal enzymes, do not occur in a strictly homogeneous medium, but they occur, I would argue, in the aqueous fluids of the cell under just such conditions of solution as obtain when they progress under the influence of enzymes *in vitro*.

There is, I know, a view which, if old, is in one modification or another still current in many quarters. This conceives of the unit of living matter as a definite, if very large and very labile molecule, and conceives of a mass of living matter as consisting of a congregation of such molecules in that definite sense in which a mass of, say, sugar is a congregation of molecules, all alike to one another. In my opinion, such a view is as inhibitory to productive thought as it is lacking in basis. It matters little whether in this connexion we speak of a "molecule" or, in order to avoid the fairly obvious misuse of a word, we use the term "biogen," or any similar expression with the same connotation. Especially, I believe, is such a view unfortunate when, as sometimes, it is made to carry the corollary that simple molecules, such as those provided by foodstuffs, only suffer change after they have become in a vague sense a part of such a giant molecule or biogen. Such assumptions became unnecessary as soon as we learnt that a stable substance may exhibit instability after it enters the living cell, not because it loses its chemical identity, and the chemical properties inherent in its own molecular structure, by being built into an unstable complex, but because in the cell it meets with agents (the intracellular enzymes) which catalyse certain reactions of which its molecule is normally capable.

Exactly what sort of material might, in the course of cosmic evolution, have first come to exhibit the elementary characters of living stuff, a question raised in the Presidential Address which so stirred us last year, we do not, of course, know. But it is clear that the living cell as we now know it is not a mass of matter composed of a congregation of like molecules, but a highly differentiated system; the cell, in the modern phraseology of physical chemistry, is a system of co-existing phases of different constitutions. Changes in any one of these constituent phases, including the metaplasmic phases, must affect the equilibrium of the whole cell system, and because of this necessary equilibrium-relation it is difficult to say that any one of the constituent phases, such as we find *permanently* present in a living cell, even a metaplasmic phase, is less essential than any other to the "life" of the cell, at least when we view it from the standpoint of metabolism. It is extremely difficult and probably impossible by any treatment of the animal to completely deprive the liver of its glycogen deposits so long as the liver cells remain alive. Even an extreme variation in the quantity is in the present connexion without significance because, as we know, the equilibrium of a polyphasic system is independent of the mass of any one of the phases; but I am inclined to the bold statement that the integrity of metabolic life of a liver cell is as much dependent on the co-existence of metaplasmic glycogen, however small in amount, as upon the co-existence of the nuclear material itself; so in other cells, if not upon glycogen, at least upon other metaplasmic constituents.

Now we should refuse to speak of the membrane of a cell, or of its glycogen store, as living material. We should not apply the term to the substances dissolved in the cell-juice, and, indeed, would hardly apply it to the highly differentiated parts of the bioplasm if we thought of each detail separately. We are probably no more justified in applying it, when we consider it by itself, to what, as the result of microscopic studies, we recognise as "undifferentiated" bioplasm. On ultimate analysis we can hardly speak at all of living matter in the cell; at any rate, we cannot, without gross misuse of terms, speak of the cell life as being associated with any one particular type of molecule. Its life is the expression of a particular dynamic equilibrium which obtains in a polyphasic system. Certain of the phases may be separated, mechanically or otherwise, as when we squeeze out the cell-juices, and find that chemical processes still go on in them; but "life," as we instinctively define it, is a property of the cell as a whole, because it depends upon the organisation of processes, upon the equilibrium displayed by the totality of the co-existing phases.

The Processes taking place in the Cell.

Important phenomena in the cell, involving simple reactions of the type which we have been discussing, occur in ordinary crystalloid solution. We are entitled to distinguish fluid (or more fluid) phases in the cell. I always think it helpful in this connexion to think of the least differentiated of animal cells—to consider, for instance, the amœba. In this creature a fluid phase comes definitely into view with the appearance of the food vacuole. In this vacuole digestion goes on, and there can be no doubt, from the suggestive experimental evidence available, that a digestive enzyme, and possibly two successive enzymes (a pepsin followed by a trypsin), appear in it. It is now generally admitted that digestion in the amœba, though intracellular, is metaplasmic. The digestion products appear first of all in simple aqueous solution. Is it not unjustifiable to assume that the next step is a total "assimilation" of the products, a direct building up of all that is produced in the vacuole into the complexes of the cell? If there be any basis for our views concerning the specificity of, say, the tissue proteins, they must apply to the amœba no less than to the higher animal, and we must picture the building-up of its specific complexes as a selective process. The mixture of amino-acids derived from the proteins of the bacteria or other food eaten by it may be inharmonious with their balance in the amœba. Some have to be more directly dealt with, by oxidation or otherwise. If the digestive hydrolysis occur outside the complexes, we may most justifiably assume that other preparative processes also occur outside them. We need not think of a visible vacuole as the only seat of such changes. Similar fluid phases in the cell may elude the microscope, and the phenomena would be just as significant if reactions occur in the water imbibed by the colloids of the cell or present in the bioplasm. It is always important to remember that 75 per cent. of the cell substance consists of water.

All of these considerations we may apply to the tissue cells of the higher animal. To my mind, at least, the following considerations appeal. It is noteworthy that all the known complexes of the cells—the proteins, the phosphorous complexes, the nucleic acids, &c.—are susceptible to hydrolysis by catalytic agents, which are always present, or potentially

present. If the available experimental evidence be honestly appraised, it points to the conclusion that only to hydrolytic processes are the complexes unstable. Under the conditions of the body they are, while intact, resistant to other types of change, their hydrolytic products being much more susceptible. Since hydroclastic agents are present in the cell we must suppose that there is at any moment equilibrium between the complexes and their water-soluble hydrolytic products, though the amount of the latter present at any moment may be very small. Now, I think we are entitled to look upon assimilation and dissimilation, when very strictly defined, as being dependent upon changes in this equilibrium alone. They are processes of condensation and hydrolysis respectively. Substances which are foreign to the normal constitution of the complexes—and these comprise not only strictly extraneous substances, but material for assimilation not yet ready for direct condensation, or metabolites which are no longer simple hydrolytic products—do not enter or re-enter the complexes. They suffer change within the cell, but not as part of the complexes. When, for instance, a supply of amino-acids transferred from the gut reaches the tissue cell they may be in excess of the contemporary limits of assimilation, or, once more, individual acids may not be present in the harmonious proportion required to form the specific proteins in the cell. Are we to suppose that all nevertheless become an integral part of the complexes before the harmony is by some mysterious means adjusted? I think rather that the normality of the cell proteins is maintained by processes which precede actual condensation or assimilation. Conversely, when the cell balance sets towards dissimilation the amino-acids liberated by hydrolysis suffer further change outside the complexes. So when a foreign substance—say, benzoic acid—enters the cell we have no evidence, experimental or other, to suggest that such a body ever becomes an integral part of the complexes. Rather does it suffer its conjugation with glycine in the fluids of the cell. So also with cases of specific chemical manufacture in organs. When, for instance, adrenalin—a simple, definite, crystalline body—appears in the cells of the gland which prepares it, are we to suppose that its molecule emerges in some way ready made from the protein complexes of the gland, rather than that a precursor derived from a normal hydrolytic product of these proteins or from the food-supply is converted into adrenalin by reactions of a comprehensible kind, occurring in aqueous solution, and involving simple molecules throughout? While referring to adrenalin I may comment upon the fact that the extraordinarily wide influence now attributed to that substance is a striking illustration of the importance of simple molecules in the dynamics of the body.

It should be, of course, understood, though the consideration does not affect the essential significance of the views I am advancing, that the isolation of reactions in particular phases of the cell is only relative. I have before emphasised the point that the equilibrium of the whole system must, to a greater or less degree, be affected by a change in any one phase. A happening of any kind in the fluid phases must affect the chemical equilibrium and, no less, the physico-chemical equilibrium, between them and the complexes or less fluid phases. A drug may have an "action" on a cell, even though it remain in solution, and it may have a specific action because its molecular constitution leads it to intrude into, and modify the course of, some one, rather than any other, of the numerous simple chemical reactions proceeding in the cells of different tissues.

THE DIRECTION AND CONTROL OF THE REACTIONS.

But I must now turn from consideration of the reactions themselves to that of their direction and control. It is clear that a special feature of the living cell is the organisation of chemical events within it. So long as we are content to conceive of all happenings as occurring within a biogen or living molecule all directive power can be attributed in some vague sense to its quite special properties.

But the last 15 years have seen grow up a doctrine of a quite different sort which, while it has difficulties of its own, has the supreme merit of possessing an experimental basis and of encouraging by its very nature further experimental work. I mean the conception that each chemical reaction within the cell is directed and controlled by a specific catalyst. I have already more than once implicitly assumed the existence of intracellular enzymes. I must now consider them more fully.

Intracellular Enzymes.

Considering the preparation made for it by the early teaching of individual biologists, the belief in the endo-enzyme as a universal agent of the cell was slow to establish itself, though in the absence of abundant experimental proof scepticism was doubtless justified. So long as the ferments demonstrated as being normally attached to the cell were only those with hydroclastic properties, such as were already familiar in the case of secreted digestive ferments, the imagination was not stirred. Only with Buchner's discovery of zymase and cell-free alcoholic fermentation did the faith begin to grow. Yet, a quarter of a century before, Hoppe-Seyler had written (when discussing the then vexed question of nomenclature, as between organised and unorganised "ferments"): "The only question to be determined is whether that hypothesis is too bold which assumes that in the organism of yeasts there is a *substance* [the italics are mine] that decomposes sugar into alcohol and CO_2. ..... I hold the hypothesis to be *necessary* because fermentations are chemical events and must have chemical causes ....." If in the last sentence of this quotation we substitute for the word "fermentations" the words "the molecular reactions which occur within the cell" Hoppe-Seyler would, I think, have been equally justified.

Remembering, however, the great multiplicity of the reactions which occur in the animal body, and remembering the narrow specificity in the range of action of an individual enzyme, we may be tempted to pause on contemplating the myriad nature of the army of enzymes that seems called for. But before judging upon the matter the mind should be prepared by a full perusal of the experimental evidence. We must call to mind the phenomena of autolysis and all the details into which they have been followed; the specificity of the proteolytic ferments concerned, and especially the evidence obtained by Abderhalden and others, that tissues contain numerous enzymes, of which some act upon only one type of polypeptide and some specifically on other polypeptides. We must remember the intracellular enzymes that split the phosphorus complexes of the cell; the lipases, the amylases, and the highly specific invert ferments, each adjusted to the hydrolysis of a particular sugar. We have also to think of a large group of enzymes acting specifically upon other substances of simple constitution, such as the arginase of Kossel and Dakin, the enzyme recently described by Dakin which acts with great potency in converting pyruvic aldehyde into lactic acid, and many others. Nothing could produce a firmer belief in the reality and importance of the specialised enzymes of the tissues than a personal repetition of the experiments of Walter Jones, Schittenhelm, Wiechowski, and others upon the agents involved in the breakdown of nucleic acids; each step in the elaborate process involves a separate catalyst. In this region of metabolism alone a small army of independent enzymes is known to play a part, each individual being of proven specificity. The final stages of the process involve oxidations which stop short at the stage of uric acid in man, but proceed to that of allantoin in most animals. It is very instructive to observe the clean, complete oxidation of uric acid to allantoin which can be induced *in vitro* under the influence of Wiechowski's preparations of the uric acid oxidase, especially if one recalls at the same time, in proof of its physiological significance, that this oxidase, though always present in the tissues of animals, which excrete allantoin, is absent from those of man, who does not.

Acquisition by the Living Cell of New Catalytic Agents.

With these examples before us, we conclude that all metabolic tissue reactions are catalysed by enzymes, and, knowing the general properties of these, we have every right to conclude that all reactions may be so catalysed in the synthetic as well as in the opposite sense. If we are astonished at the vast array of specific catalysts which must be present in the tissues, there are other facts which increase the complexity of things. Evidence continues to accumulate from the biological side to show that, as a matter of fact, the living cell can acquire *de novo* as the result of special stimulation new catalytic agents previously foreign to its organisation.

It is certain, from very numerous studies made upon the lower organisms, and especially upon bacteria, that the cell may acquire new chemical powers when made to depend upon an unaccustomed nutritive medium. I must be

content to quote a single instance out of many. Twort has shown that certain bacteria of the coli-typhosus group can be trained to split sugars and alcohols which originally they could not split at all. A strain of B. typhosus which after being grown upon a medium containing dulcite had acquired the power of splitting this substance, retained it permanently, even after passage through the body of the guinea-pig, and cultivation upon a dulcite-free medium. Similar observations have been made upon the Continent by Massini and Burri; the latter showed by ingenious experiments that all the individuals of a race which acquires such a new property have the same potency for acquiring it. Yet no one will deny that the appearance of a new enzyme is involved in this adjustment of the cell to a new nutritive medium.

We have not, it is true, so much evidence for similar phenomena in the case of the higher animals. The milk-sugar splitting ferment may be absent from the gut epithelium before birth, and in some animals may disappear again after the period of suckling, but here we probably have to do with some simple alternation of latency and activisation. But among the protective ferments studied by Abderhalden we have, perhaps, cases in which specific individuals appear *de novo* as the result of injecting foreign proteins, &c., into the circulation. Consider, moreover, the case of the reactions called out by simpler substances. We have seen that an enzyme separable from the kidney tissue can catalyse the synthesis no less than the breakdown of hippuric acid. Now, the cells of the mammalian kidney have always had to deal with benzoic acid or chemical precursors of benzoic acid, and the presence of a specific enzyme related to it is not surprising. But living cells are not likely to have ever been in contact with, say, bromo-benzol until the substance was administered to animals experimentally. Yet a definite reaction at once proceeds when that substance is introduced into the body. It is linked up, as we have seen, with cystein. Now, this reaction is not one which would proceed in the body uncatalysed; if it be catalysed by an enzyme, all that we know about the specificity of such agents would suggest that a new one must appear for the purpose. I have allowed myself to go beyond ascertained facts in dealing with this last point. But once we have granted that specific enzymes are real agents in the cell, controlling a great number of reactions, I can see no logical reason for supposing that a different class of mechanism can be concerned with any particular reaction.

THE POSSIBILITY OF AN UNDERLYING SIMPLICITY.

If we are entitled to conceive of so large a part of the chemical dynamics of the cell as comprising simple metaplasmic reactions catalysed by independent specific enzymes, it is certain that our pure chemical studies of the happenings in tissue extracts, expressed cell juices, and the like, gain enormously in meaning and significance. We make a real step forward when we escape from the vagueness which attaches to the "bioplasmic molecule" considered as the seat of all change. But I am not so foolish as to urge that the step is one towards obvious simplicity in our views concerning the cell. For what, indeed, are we to think of a chemical system in which so great an array of distinct catalysing agents is present or potentially present—a system, I would add, which, when disturbed by the entry of a foreign substance, regains its equilibrium through the agency of new-born catalysts adjusted to entirely new reactions? Here seems justification enough for the vitalistic view that events in the living cell are determined by final as well as by proximate causes, that its constitution has reference to the future as well as the past. But how can we conceive that any event called forth in any system by the entry of a simple molecule, an event related qualitatively to the structure of that molecule, can be of other than a chemical nature! The very complexity, therefore, which is apparent in the catalytic phenomena of the cell to my mind indicates that we must have here a case of what Henri Poincaré has called *la simplicité cachée*. Underlying the extreme complexity we may discover a simplicity which now escapes us. The subject should attract the contemplative chemist, and especially him who is interested and versed in the dynamical side of his subject. If he can arrive at any hypothesis sufficiently general to direct research he will have opened a new chapter of organic chemistry—almost will he have created a new chemistry.

DYNAMIC PHENOMENA IN WHICH THE CELL COMPLEXES PLAY A PROMINENT PART.

Paul Ehrlich, in his illuminating address to the International Congress of Medicine,[1] remarked that if in chemistry it be true that *Corpora non agunt nisi liquida*, then in chemiotherapy it is no less true that *Corpora non agunt nisi fixata*. Whatever precisely may be involved in the important principle of "fixation" as applied to drug actions, it remains, I think, true that the older adage applies to the dynamic *reactions* which occur in the living cell. But there are doubtless dynamic phenomena in which the cell complexes play a prominent part. The whole of our doctrine concerning the reaction of the body to the toxins of disease is based upon the fact that when the cell is invaded by complexes other than those normal to it, its own complexes become involved. I must not attempt to deal with these phenomena, but rather proceed to my closing remarks. I would like, however, just to express the hope that the chemist will recognise their theoretical importance. He will not, indeed, be surprised at the oligo-dynamic aspects of the phenomena, startling as they are. When physico-chemical factors enter into a phenomenon the influence of an infinitely small amount of material may always be expected. It is a fact, for instance, as Dr. W. H. Mills reminds me, that when a substance crystallises in more than one form it may be quite impossible to obtain the less stable forms of its crystals in any laboratory which has been "infected" with the more stable form, even though this infection has been produced by quite ordinary manipulations dealing with the latter. Here certainly is a case in which the influence of the infinitesimal is before us. But what I feel should arrest the interest of the chemist is the remarkable mingling of the general with the particular which phenomena like those of immunity display. In the relations which obtain between toxin and antitoxin, for example, we find that physico-chemical factors predominate, and yet they are associated to a high degree with the character of specificity. The colloid state of matter, as such, and the properties of surface determine many of the characteristics of such reactions, yet the chemical aspect is always to the front. Combinations are observed which do not seem to be chemical compounds, but rather associations by adsorption; yet the mutual relations between the interacting complexes are in the highest degree discriminative and specific. The chemical factor in adsorption phenomena has, of course, been recognised elsewhere, but in biology it is particularly striking. Theoretical chemistry must hasten to take account of it. The modern developments in the study of valency probably constitute a step in this direction.

CLOSING REMARKS.

It is clear to everyone that the physical chemist is playing, and will continue to play, a most important part in the investigation of biological phenomena. We need, I think, have no doubt that in this country he will turn to our problems, for the kind of work he has to do seems to suit our national tastes and talents, and the biologist just now is much alive to the value of his results. But I rather feel that the organic chemist needs more wooing and gets less, though I am sure that his aid is equally necessary. In connexion with most biological problems, physical and organic chemists have clearly defined tasks. To take one instance. In muscle phenomena it is becoming every day clearer that the mechanico-motor properties of the tissue, its changes of tension, its contraction and relaxation, depend upon physico-chemical phenomena associated with its colloidal complexes and its intimate structure. Changes in hydrogen-ion concentration and in the concentration of electrolytes generally, by acting upon surfaces or by upsetting osmotic equilibria, seem to be the determining causes of muscular movement. Yet the energy of the muscle is continuously supplied by the progress of organic reactions, and for a full understanding of events we need to know every detail of their course. Here, then, as everywhere else is the need for the organic chemist.

But I would urge upon any young chemist who thinks of occupying himself with biological problems the necessity for submitting for a year or two to a second discipline. If he merely migrate to a biological institute, prepared to determine the constitution of new products from the animal and study their reactions *in vitro*, he will be a very useful and acceptable person, but he will not become a biochemist. We

[1] THE LANCET, August 16th, 1913.

want to learn how reactions run in the organism, and there is abundant evidence to show how little a mere knowledge of the constitution of substances and a consideration of laboratory possibilities can help on such knowledge. The animal body usually does the unexpected.

But if the organic chemist will get into touch with the animal, it is sure that the possession of his special knowledge will serve him well. Difficulties and peculiarities in connexion with technique may lead the professor of pure chemistry to call his work amateurish, and certainly his results, unlike those of the physical chemist, will not straightway lend themselves to mathematical treatment. He may himself, too, meet from time to time the spectre of Vitalism, and be led quite unjustifiably to wonder whether all his work may not be wide of the mark. But if he will first obtain for us a further supply of valuable qualitative facts concerning the reactions in the body, we may then say to him, as Tranio said to his master:

> The mathematics and the metaphysics
> Fall to them as you find your stomach serves you.

All of us who are engaged in applying chemistry and physics to the study of living phenomena are apt to be posed with questions as to our goal, although we have but just set out on our journey. It seems to me that we should be content to believe that we shall ultimately be able at least to describe the living animal in the sense that the morphologist has described the dead; if such descriptions do not amount to final explanations, it is not our fault. If in "life" there be some final residuum fated always to elude our methods, there is always the comforting truth to which Robert Louis Stevenson gave perhaps the finest expression when he wrote:

> To travel hopefully is better than to arrive,
> And the true success is labour.

THE NECESSITY FOR INTERNATIONAL REFORMS IN THE SANITATION OF CREW SPACES ON MERCHANT VESSELS.[1]

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THE hygiene of dwellings has received great attention during recent years, and praiseworthy advances have been made in the direction of improving the sanitation of houses, but unfortunately the hygiene of "crew spaces" has to a great extent been neglected. New vessels are still being built which contravene the most elementary principles of domestic hygiene, and as a vessel may sail during its lifetime under several flags, the question is essentially an international one. The hygiene of crew spaces has been sadly neglected, both nationally and internationally, in spite of the fact that the conditions under which crews live are far worse than those which obtain in workshops and factories and dwellings ashore where they are subject to laws and by-laws and regulations in every direction. The programme of the Fourth International Congress includes the subjects of the hygiene of passenger ships, sailors' homes, and men-of-war, but the hygiene of crew spaces of the mercantile marine was not referred to, and I am therefore very pleased to accept the kind invitation of the President of the Congress to draw the attention of the Congress to this important question.

In Great Britain and Ireland the Board of Trade have had the supervision of the hygiene of all new merchant ships, and that standard has been accepted, with minor reservations, by most continental countries; but of late the subject has received considerable attention on the part of the maritime nations of Europe, and those countries are demanding a higher standard of hygiene in some respects than obtains under the English Board of Trade. The housing conditions in one country, however bad, will not necessarily affect the inhabitants of other countries, as each country is practically self-contained; but when we come to consider marine hygiene we find that it concerns all nations which "go down to the sea in ships," for marine trade is international in character. Not only do vessels visit foreign ports to a great extent, but the crews are largely cosmopolitan in character, and it is not an uncommon thing to see half-a-dozen European countries represented among the crew of a vessel.

Every Government looks after the interests of its subjects when abroad, and in order to ensure this consuls are appointed in all foreign ports of importance. No maritime country can therefore afford to ignore the hygiene of the vessels of other countries as long as their sailors serve upon the vessels of other nations.

Owing to the keen competition which exists in the merchant service vessels are designed with the view of carrying as much cargo as possible, in consequence of which the accommodation provided for the crew is frequently most unsatisfactory, not only in the forecastles but also in the officers' quarters. Shipowners generally entrust the design and construction of the crews' quarters to the ship-builders or surveyors, and undoubtedly far better accommodation could be provided for the crews at a very small extra cost, and it is a source of satisfaction to sanitarians to find that there is a growing tendency and desire on the part of shipping companies to provide better housing for the men on board their vessels. Reforms in this direction would, however, be much more rapid if the subject received international consideration. It is evident from a letter which I received recently from a Norwegian Customs official, who takes a great interest in the subject, that endeavours are being made to hold an international congress on the subject.

Although vessels are built under the supervision and according to the requirements of the Board of Trade, when they visit a port they come under the observation of the Port Sanitary Authority, and in England these authorities endeavour to remedy insanitary conditions which may exist on board as far as this is possible under the circumstances. The Port medical officers of health are fully alive to the necessity for a thorough revision of the standard of hygiene of crew spaces. In support of this statement I beg to quote from the annual reports of other medical officers of health.

1. Dr. D. S. Davies, in his report to the Bristol Port Sanitary Authority for 1911, says:—

> The nature of the living accommodation provided for seamen and firemen in tramp and other ships, as noted in previous years, is very variable. In some, fair space is given, with seats, tables, and lockers in the living space used for sleeping purposes, and in a few others a messroom is provided, whilst in some others the bare regulation space, with unlined iron surfaces of bulkheads, sides, &c., is allowed, some without seats or tables, the sleeping bunks, which are chiefly arranged in tiers, being available only for all purposes. A very few were provided with a bathroom, which is a great boon, especially to firemen. The best and most comfortable conditions were found chiefly in foreign-owned ships, with a few exceptions.
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> The lighting of some crew spaces inspected was very indifferent, but, having been passed by the surveyors when the ship was constructed, it is difficult to enforce additions, but there is room for improvement in many cases in the size and number of light ports. Defective ventilation, such as is usually provided, occurred in nine instances, all in foreign ships, chiefly of the small class. The usual request was made for remedy, but without success up to the time the ships left the port.
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> Leakages into living spaces was again one of the chief causes of complaint, and these occurred in 55 cases, which was an increase of 10 on last year's result. Bad drinking-water supplies were found in 16 ships and the necessary steps were taken to clean tanks and renew supplies; this number being an increase of five on last year.

2. In his annual report for 1911 to the Port of London Dr. Herbert Williams drew attention to the matter as follows:—

> It may be said that the crews' quarters on vessels are habitually overcrowded, when judged by the lowest standard of accommodation which exists or is permitted on shore, which cubic capacity is, in the case of common lodging-houses occupied by day and night, 400 cubic feet, whereas seamen may only have 72 cubic feet per head. The conditions under which seamen on vessels live are particularly favourable for the dissemination of pulmonary tuberculosis, and it would seem that until the legislature takes some more practical interest in the welfare of seamen, pulmonary tuberculosis will continue to be a cause of much mortality amongst this class of men. I have pointed out before that the conditions of life on vessels for seamen can be much improved, especially in new vessels, without much addition to the prime cost of construction. The crews' quarters should be situated above deck, preferably in the after-part of the ship. This position will enable their quarters to be provided with skylights and adequate means of ventilation. Ventilation means the regular supply of fresh air to the inhabited spaces, without the creation of a draught. The present regulations of the Board of Trade merely insist on the provision of a ventilator, which is often situated over a berth, and is generally stopped up from below, or the external opening is covered up with canvas. Complaints are made of the degeneracy of seamen found on British ships. They can, indeed, do little else but degenerate under the present conditions. Persons who travel by steamer, and are enabled to sleep in state-rooms below deck, are often only too cognisant, of the imperfect ventilation found in ordinary steamers, even under such favourable circumstances, where the state-room is inhabited usually only for a few hours at night. They can easily imagine the condition of the seamen shut up in

[1] A paper read at the Fourth International Congress for the Hygiene and Salubrity of Dwellings, held at Antwerp, August 31st to Sept. 7th, 1913.

quarters below deck which are practically in constant use as a sleeping, living, and dining room, generally dark, dirty, damp, and encumbered with clothing. In some of the smaller vessels the men have even to provide and to keep their food in their quarters.

3. In the course of his annual report, 1911, Dr. E. W. Hope, the medical officer of health at Liverpool, remarks under the heading, "Diseases Incident upon Sailors; Sanitation of Vessels":—

The diseases to which sailors are peculiarly liable fall under four headings: (*a*) Those which are caused by the peculiar stresses of the work; (*b*) those attending the vices to which sailors in foreign ports are particularly addicted: alcoholism and venereal diseases; (*c*) tropical diseases, including malaria, beri-beri, &c.; (*d*) those associated with the peculiar environment of the sailor, such as damp forecastles contaminated water-supplies, and the close association of the sick with the healthy in the confined quarters on shipboard.

It is against the latter classes of disease that the efforts of the Port Sanitary Authority for improving the sanitation of vessels are directed.

The defects are classified under three headings as arising from: (*a*) Faulty construction; (*b*) wear and tear; (*c*) lack of cleanliness and nuisance.

A large number of the defects included under the third heading that are found on British ships arise from the crews having been paid off and the forecastles being unoccupied. This is specially applicable to the tramp class of vessel. In the case of ships of foreign nationality or carrying "native" crews the crew are at the time inhabiting quarters where filth or nuisance exists.

For many years I have personally drawn attention to the deplorably insanitary conditions which exist on board merchant vessels. Among the matters referred to in those reports which still demand attention are the following:—

Regulations for ensuring a higher standard of hygiene on the part of both masters and other members of the crew.

The inadequate attention frequently given in the designing of the crews' spaces on new vessels to the elementary principles of domestic hygiene; the accommodation provided on many new vessels being very unsatisfactory and antiquated.

The desirability of the appointment of an Inter-Departmental Committee of the Board of Trade and Local Government Board for considering the whole question of the hygiene of the merchant service.

Ventilation (Annual Report 1912).—This is often very unsatisfactory. The minimum requirements are two ventilators. One deck ventilator and an opening over the door of the forecastle leading into the alleyway is the usual type provided. Unfortunately, in cold weather the only deck ventilator is frequently utilised for the stove pipe. The alleyways leading to the officers' and engineers' quarters are also frequently very badly ventilated. This affects the ventilation of the rooms leading from such alleyways.

Chain lockers.—The filth which is taken on board from docks, wharves, &c., on the anchor chain ferments and gives rise to effluvia, and precautions are necessary to prevent such effluvia contaminating the forecastles, through which these chain lockers usually pass from the forecastle deck above. When these chain lockers are made of wood, as they frequently are, the joints soon separate and allow of effluvia to enter the forecastles from these enclosed spaces.

Ship stores.—The space provided for ship stores is generally very scanty, consequently if there are two water-closets for the men, one of them is often converted into a paint locker, lamp room, or rope stores, &c.

Cubic space.—This could, with advantage and without perceptibly affecting the commercial value of the vessel, be materially increased. When we consider the nature and quality of the ventilation usually provided, 120 cubic feet per head cannot be considered satisfactory.

Floor space.—This is also very inadequate in many modern vessels, including those recently built, so much of the space being taken up with bunks, seats, tables, lockers, pipes, stoves, weekly stores, and the trunks of the crew. Under such conditions it is very difficult to keep forecastles clean and wholesome.

Lighting of crew spaces.—The value of light in domestic hygiene has been thoroughly established, and the Board of Trade Regulations state that every space appropriated to the use of the crew must be properly lighted. The standard upon which surveyors are to judge the adequacy of the lighting is the ability to read the print of an ordinary newspaper *in any part* of the space when the ship is new and the paint clean. Few vessels would pass such a standard under ordinary working conditions. Most vessels have the bunks fixed against the sides of the vessels, the upper row being placed 6 to 12 inches below the portholes, consequently the lighting of the lower parts of the forecastles is obstructed by these fittings, and in some parts is hardly sufficient to make darkness visible. A great portion of the floor space in particular is very dark. This naturally leads to neglect in respect to the cleansing of those spaces. This interference with the efficient lighting of the forecastles is not the only objection to the practice of placing the bunks against the ship's side; it also interferes with the use of the portholes as ventilators, as the occupiers of the upper bunks just under the portholes object to the wind and rain beating upon them when the portholes are open. The use of white paint or enamel greatly improves the lighting of crews' spaces; it also renders any dirt visible and draws attention to the necessity for more frequent washing of the woodwork, &c. Lime washing is compulsory in some Indian ports. Unfortunately, its cleansing properties are evanescent and more than counterbalanced by its perishable nature. It cannot be washed or cleaned, is rough, harbours dust, and soon peels off and falls on the bunks, food, &c.

Lavatory accommodation.—The standard of decency in this respect is very low. The type of water-closet so often provided on vessels, even on some of the newest, has long since been condemned by sanitary officials, whilst the lack of facilities for ablutions does not conduce to cleanliness of person. These rough trough-closets, as a rule, are not provided with valves, consequently in rough weather they are liable to get flooded by sea water, in which case the contents get washed on to the floor, or may foul the occupier.

Forecastles.—Continental shipowners in particular are realising the advantages of housing the crew under the "poop" aft instead of in the forecastle forward. In many of the second-hand vessels purchased by continental shipowners from British owners the crew have been transferred aft. The poop provides far more commodious, comfortable, convenient, and much lighter quarters than are available forward. The British Board of Trade have recently revised their instructions to their surveyors who supervise the building of new vessels, but most of the improvements take the form of suggestions, and are not compulsory.

Tuberculosis.—A great fight is being carried on throughout Europe against tuberculosis. One of the great forces in this fight is the provision of healthy houses. The living conditions obtaining on our merchant vessels, more especially the inadequate lighting, ventilation, and cleansing, place the crews at a great disadvantage when exposed to infection from companions suffering from consumption. The disease is certainly very prevalent among sailors and firemen, but correct statistics are unavailable, as many sailors die abroad at sea, and are therefore not included in British vital statistics. Thirty-nine out of 165 cases of sickness which occurred during the voyages or after arrival of vessels at a neighbouring port during 1912 were cases of phthisis. Those men, with the exception of those who died at sea, would have to be dealt with ashore; the conditions of living at sea is therefore a matter which vitally concerns us all, and every endeavour should be made to improve the hygiene of our marine services.

We must bear in mind that the conditions of living on board merchant vessels would be greatly improved by the exercise of stricter discipline and supervision on the part of the masters and officers. International regulations should be framed for ensuring satisfactory domestic sanitation on the part of masters and men. Public health regulations are enforced in connexion with all important trades ashore. This lack of supervision is common to all nationalities more or less, as will be seen from the following summary of the insanitary vessels which were discovered at Newport during the years 1898 to 1908:—

Country.	Average per cent. (insanitary).	Country.	Average per cent. (insanitary).
Denmark	10·5	France	18·5
Norway	11·11	Russia	19·5
Germany	11·27	Belgium	20·9
Sweden	11·4	Portugal	22·59
Austria	13·27	Spain	26·2
Great Britain	13·99	Greece	29·8
Holland	18·3	Italy	32·7

The trade unions which look after the interests of sailors and firemen can assist in this matter not only by educating their members to a higher standard of cleanliness, but also by promoting any reforms which will give masters the power to enforce any rules for better hygiene in the forecastles, which now frequently are rendered unfit for habitation by the action of one or more careless members of the crew.

The Congress has the advantage of meeting in one of the great ports of Europe, and a visit to the docks at Antwerp would satisfy every inquirer on this subject that the matter can only be dealt with satisfactorily by international action. The question of uniformity of action in dealing with the dangers of invasion by cholera, yellow fever, and plague has been the subject of an International Conference which led to a common basis of action, and those regulations are now undergoing international revision. This fact proves that such subjects can be dealt with successfully, and the case for international regulations is much stronger when we consider marine hygiene, as it deals with the everyday life of those who live at sea under very depressing and unsatisfactory conditions which tend to lower the standard of work and to drive self-respecting individuals to seek employment ashore. Such a Conference should not be confined to Board of Trade officials, but should include all interests concerned, in order that the regulations might be satisfactory from the point of view of owners, masters, crew, the Board of Trade, and public health officials.

I sincerely trust, therefore, that this Congress will decide to further the appointment of a small international conference on the subject, and that the Permanent International Committee will, after the Congress, keep it under consideration until definite action is taken in the matter.

Newport, Mon.

THE DETECTION OF SMALL AMOUNTS OF GLUCOSE IN URINE.

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IT has been repeatedly demonstrated that by the application of Fehling's test alone one cannot with any certainty demonstrate the existence of a small amount of glucose in a specimen of urine. I have elsewhere enlarged on the fallacies of the test.[1] Briefly stated, they are. 1. Urates reduce Fehling's solution. 2. Creatinine reduces Fehling's solution and also forms a soluble compound with cuprous oxide,[2] thus preventing the detection of a small amount of sugar. 3. Sodium hydroxide, if present in excess, destroys a small amount of glucose.[3] 4. Conjugated glycuronates are hydrolysed to reducing substances by sodium hydroxide. 5. The mixed solution is unstable, and if kept suffers auto-reduction on boiling. 6. The solution is reduced by lactose, a normal constituent of the urine of women during the period of lactation. 7. The solution is reduced by pentoses, which, however, are rarely found in urine.

In the case of a large number of samples of urine as much as 0·5 per cent. of glucose can be added without producing, when tried with Fehling's test, anything more than the greenish cloud that is seen with specimens that can be shown, by more suitable methods, to contain no more than the average normal amount of glucose. It cannot be too strongly urged that for the detection of small degrees of glycosuria Fehling's method is extremely unreliable, and the use of the reagent is almost certain to lead to erroneous conclusions.

In choosing a method to supersede Fehling's one must not lose sight of the fact that normal urine contains a small amount of glucose. The percentage calculated by different methods varies between 0·03 and 0·08. I certainly think that the latter is too high for the samples I have tried, but the exact figure is not material. It is of the greatest importance to be able to determine any excess of glucose, however small, above the normal. Macleod[4] emphasises this point. "If there really is an excess of dextrose, however small, it indicates that something is amiss with the utilisation of carbohydrates in the organism; it is a danger signal which if heeded and the proper treatment applied, may unquestionably enable us to stave off the incidence of what might afterwards prove a deadly diabetes."

[1] Practical Physiological Chemistry, S. W. Cole, third edition, 1913, p. 161.
[2] Hugh MacLean: Biochemical Journal, vol. i., 1906, p. 111.
[3] S. R. Benedict: Journal of Biological Chemistry, vol. iii., 1907, p. 101.
[4] J. J. R. Macleod: Diabetes: its Pathological Physiology, 1913, p. 16.

From an extensive series of experiments that I have made I am convinced that of the great number of tests that have so far been devised Benedict's[5] is the most satisfactory one to use in the great majority of cases. The substitution of sodium hydroxide by sodium carbonate overcomes the first four of the objections to Fehling's solution, and the use of sodium citrate instead of Rochelle salt renders the mixed solution perfectly stable. In fact, the only serious objection to it is that it gives a marked reaction with lactose.

As has been pointed out elsewhere,[6] a greyish precipitate of urates and phosphates may appear and lead to a slight amount of indecision.

Nylander's test when correctly applied[7] is also valuable in a negative sense—that is to say, a negative reaction indicates that the condition of glycosuria does not exist. But a positive test is yielded by other substances, and so cannot be relied upon as an indication of the condition of glycosuria.

The phenyl-hydrazine test for demonstrating the presence of glucose is very reliable when correctly performed. But it is almost too delicate. A large number of normal urines yield undoubted crystals of the glucosazone. In this connexion it may be pointed out that the most sensitive method of performing the test in my experience is as follows:

To 10 c.c. of the protein-free urine in a test-tube add six drops of glacial acetic acid, enough solid phenyl-hydrazine-hydrochloride to cover a shilling, and twice this amount of solid sodium acetate. Heat to dissolve and filter into another test-tube. Immerse this in a boiling water bath for 40 minutes. Turn out the flame and allow the tube to cool in the bath for an hour.

I find that the addition of the acetic acid markedly increases the case with which crystals can be obtained. Binet[8] uses acetic acid after the use of lead acetate, but I find that the previous precipitation of the urine by lead is of very doubtful advantage.

During the course of another investigation I had occasion to use blood charcoal for the purpose of decolourising urine. I noted the fact that urates and creatinine are adsorbed with great readiness. In many of my experiments I obtained a filtrate containing only about 1 per cent. of the urates and 3 per cent. of the creatinine of the urine, and in some I apparently removed the whole of these substances that so markedly interfere with Fehling's test.

The adsorption of glucose from pure solution by blood charcoal has been studied by Rona and Michaelis.[9] They find that the addition of 10 per cent. of acetic acid or of 15 per cent. of acetone prevents the adsorption of glucose by charcoal. Andersen[10] confirms this for glucose in urine.

I have investigated the adsorption of glucose and lactose from water and urine under a variety of conditions. Some of the results are given below. The charcoal used was Merck's pure blood charcoal. The adsorptions were conducted at room temperature for 1½ hours in each case. The sugar was estimated by a sensitive polarimeter using both the sodium yellow and the mercury green.[11]

Glucose.

Per cent.	Per cent. charcoal.	Per cent. adsorbed from water.	Per cent. adsorbed from urine.	Per cent. adsorbed from 10 % acetic acid.	Per cent. adsorbed from urine + 10 % acetic acid.
1·78	6·35	55·5	50·2	1·1	1·7
0·91	4·5	52·5	27·9	0	0·8
0·49	5·0	63·8	31·2	—	—
0·49	5·0	65·0	44·9	—	—
0·36	4·6	65·0	42·2	0	0
			Lactose.		
1·80	6·35	88·9	77·5	17·9	6·6
0·91	4·5	97·5	76·5	5·3	4·8
0·51	5·0	100·0	86·5	—	—
0·51	5·0	100·0	92·5	—	—

[5] Stanley R. Benedict: Journal of Biological Chemistry, vol. v., 1909, p. 485.
[6] Macleod, loc. cit., p. 20.
[7] Cole, loc. cit., p. 161.
[8] P. Binet: Jahresbericht für Tierchemie, 1892, p. 506.
[9] Rona and Michaelis: Biochemische Zeitschrift, Band xvi., 1909, p. 491.
[10] Andersen: Ibid., Band xxxvii., 1911, p. 262.
[11] I am indebted to Professor Pope for his courtesy in allowing me to use his apparatus, and to his assistant, Mr. Williams, for help in making the observations.

It will be noted that the adsorption of both sugars in the absence of acetic acid is considerably less from urine than from pure aqueous solutions. Also that the adsorption of lactose is very much greater than that of glucose. Taking advantage of these facts, I have elaborated a comparatively simple method of detecting quite small amounts of glucose when present in urine.

There are two fundamental principles underlying my method: 1. Charcoal in a certain percentage adsorbs the greater part of the non-saccharine reducing substances of normal urine, the greater part of any lactose that may be present, and also a certain amount of the glucose normally present. 2. The filtrate is boiled with sodium carbonate, and thus converted to a reducing substance [12] which reacts with copper when subsequently added.

Owing to the great ease with which sugar can be detected in the filtrate after adsorption with charcoal, I had considerable difficulty in finding the exact conditions so that the normal sugar of urine should not give a positive test. I believe that I have succeeded in my object and have also found a simple method for distinguishing lactose from glucose. The details of the method are as follows:—

In a dry boiling tube or large test-tube place about 1 gm. [13] of Merck's pure blood charcoal.[14] Add 10 c.c. of the urine and shake from side to side to mix thoroughly. Heat to boiling point, shaking the whole time. Cool thoroughly under the tap and shake at intervals for about five minutes. Filter through a small paper (9 to 11 cm. in diameter) into a rather wide test-tube containing about half a gramme of anhydrous sodium carbonate.[15] When the fluid has filtered through add 6 drops of pure glycerine,[16] shake and heat to boiling.[17] Note the time when boiling commences. Maintain active boiling for 50 seconds, shaking from side to side to prevent spurting. Immediately add 4 drops of a 5 per cent. solution of crystallised copper sulphate.[18] Shake for a moment to mix the solutions, and allow the tube to stand without further heating for one minute. With normal urine the fluid remains blue, with a variable amount of a greyish precipitate of the earthy phosphates. If glucose is present to the extent of 0·02 per cent. or more above the average normal amount the blue colour is discharged, and a yellowish precipitate of cuprous hydroxide forms.

The rapidity with which the precipitate forms is a rough measure of the amount of glucose present. With 0·05 per cent. it appears in a few seconds. With 0·02 per cent. it may not appear till 50 seconds. A yellowish precipitate or colouration appearing after 60 seconds must not be taken as evidence of any degree of abnormal glycosuria. It may be due to the normal amount of sugar in urine.

I have experimented with the urine passed by a large number of apparently healthy individuals. Only once have I obtained a positive result, and in that case the yield of osazone crystals was so large that I am convinced that a slight degree of glycosuria existed. It is interesting to note that the sample in question gave a negative result with Benedict's and Nylander's methods. But my method, in my hands, is more sensitive than either of these.

Chloroform does not give a positive reaction, even when present in considerable excess. I have repeatedly tried the urines of patients treated with relatively large doses of chloral. In no case have I obtained a positive result, though I was able to demonstrate the presence of glycuronates by Tollen's and Bial's tests. And in all cases the characteristic slow reduction of Fehling's solution was obtained.

There is no necessity to remove albumin, but it is advisable to do so by boiling and filtering; otherwise the coagulation of the albumin when boiled with the charcoal interferes somewhat with filtration. Should the specific gravity of the urine exceed 1025 it is advisable to dilute it with an equal volume of water and to take 10 c.c. of the diluted urine.

[12] Benedict: Journal of Biological Chemistry, vol. iii., 1907, p. 101.

[13] This can be approximately measured by means of a spatula or the large blade of a pen-knife. A spatula three-eighths of an inch broad, well piled up with the charcoal for just over an inch, carries about ½ gm.

[14] The only charcoal that is free from suspicion is Merck's "Blutkohle, mit säure gereinigt." It can be obtained from Baird and Tatlock's.

[15] I recommend the use of Baird and Tatlock's "extra pure anhydrous." A quarter of a gramme is carried by about one-half of an inch of the large blade of an ordinary pocket-knife.

[16] Baird and Tatlock's pure glycerine—sp. gr. 1·260—is to be recommended, since it gives no reduction when boiled with alkalies and copper sulphate. But all the samples that I have tested lose their reducing power when boiled with alkalies for the time I mention.

[17] It is advisable to use a test-tube holder, which can be improvised by folding stiff writing paper.

[18] This can be obtained approximately by diluting a cold saturated solution with five times its volume of distilled water.

Test for glucose in pure solution.—Provided that pure glycerine can be obtained that does not give a reduction on boiling with alkalies and copper sulphate, a very sensitive reduction test can be performed as follows:—

To 5 c.c. of the solution add 6 drops of glycerine, 2 drops of 40 per cent. sodium hydroxide, and a drop of a saturated solution of copper sulphate. Shake to mix, and boil for a minute. A yellow or red precipitate separates out.

With dilute solutions of sugar it is necessary to decrease the concentration of the alkali and the copper. By using a single drop of 5 per cent. soda and 2 or 3 drops of 1 per cent. copper sulphate, I can detect one part of glucose in a million parts of water.

Distinction between lactose and glucose.—In the case of urine from a pregnant or nursing woman the following procedure should be adopted:—

Treat 20 c.c. of the urine with 1 gm. of charcoal as described above. Treat the whole of the filtrate with another gramme of charcoal and repeat the process. To 5 c.c. of the filtrate from this add ½ gm. of sodium carbonate and 6 drops of glycerine and boil for 50 seconds. Now add to the hot solution 4 drops of the 5 per cent. copper sulphate and set the tube aside for one minute. A reduction occurring within the specified time indicates the presence of at least 0·04 per cent. of glucose in the urine.

If less than 0·3 per cent. of lactose is present it is entirely adsorbed by 10 per cent. of charcoal, as in the routine method. By using 5 per cent. of charcoal, as in the special modification, a considerable amount of lactose is removed, and that left is entirely adsorbed by the second treatment. I find that the adsorption of lactose from the filtrate from decolourised urine is practically identical with that from water. By the addition of as much as 1 per cent. of lactose to urine I have failed to get a positive test when tried in this manner; whereas 0·04 per cent. of glucose gives a distinct reaction. Should this test give a negative result, though the original urine responds to Benedict's test, the urine almost certainly contains lactose.

The identification of lactose in urine.—I do not know of any simple method hitherto published of demonstrating the existence of lactose in urine. The osazone, probably owing to its relative solubility, does not usually separate when the osazone test is applied direct to the urine. (I do find, however, that the addition of 10 per cent. of acetic acid results in a small yield with 0·5 per cent. of lactose added to the urine.) The mucic acid test is a good one, but the evaporation with the nitric acid is inconvenient. The failure to obtain fermentation with yeast also involves much delay in diagnosis and is not very certain. By taking advantage of the difference in the adsorption of lactose from urine in the absence or presence of acetic acid I can obtain typical lactosazone crystals from urine containing as little as 0·15 per cent. of lactose. The method is as follows:—

To 1 gm. of charcoal add 25 c.c. of the suspected urine, mix by shaking, boil for a few seconds, cool thoroughly, and shake at intervals for 10 minutes. Filter through a small paper or use a filter pump. When the charcoal has completely drained transfer it to a porcelain dish containing 10 c.c. of water and 1 c.c. of glacial acetic acid. This is best done by opening the paper, holding it by the clean half and moving it about in the liquid. The greater part of the charcoal is thus removed from the paper. Stir the charcoal with a glass rod and transfer the mixture to a boiling tube. Heat to boiling for about 10 seconds and filter the hot solution through a small paper into a test-tube containing as much solid phenyl-hydrazine-hydrochloride as will lie on a shilling, and twice this amount of solid sodium acetate. Mix thoroughly and filter from any insoluble oily residue. Place the tube in a boiling water bath and leave it there for 45 minutes. Remove the tube and allow it to stand at room temperature for at least one hour. It is advisable to allow it to stand longer if possible. Pipette off a little of the deposit, if any, and examine it on a slide under the high power of a microscope.

Lactosazone crystallises in characteristic clumps with projecting spines ("hedge-hog" crystals). It can be recrystallised by filtering through a small paper, washing with a small amount of distilled water, and then passing about 4 c.c. of boiling water through the paper into a clean tube. The filtrate is boiled and passed through the paper two or three times, boiling between every filtration. On allowing the solution to stand, typical crystals of the osazone separate out. They can be filtered off, dried, and the melting point taken (200° C.).

I trust that the publication of these methods will encourage the routine examination of all specimens of urine for small amounts of glucose. In that way, I believe, valuable information as to the limits of tolerance to carbohydrates in various pathological conditions would come to hand.

THE INCIDENCE OF INHERITED SYPHILIS IN CONGENITAL MENTAL DEFICIENCY.

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INHERITED syphilis has for many years been regarded as a possible factor in the causation of congenital mental deficiency. Up to recent years the evidence of this infection depended on an inquiry into the family history, or on stigmata of the disease in the patients themselves. Upon this evidence most observers were able to show only a small percentage of cases of congenital mental deficiency which might be associated with inherited syphilis. Sherlock,[1] on the other hand, found satisfactory evidence of syphilis in one or other parent in 14·4 per cent. of 90 cases.

It is now generally recognised that an individual may suffer from a syphilitic infection without showing marked clinical signs of the disease, and the introduction of the Wassermann reaction overcame the difficulty in recognising the infection in such cases. Opinions still differ as to the value of this reaction, but a positive finding is usually accepted as strong evidence of a syphilitic infection, even in the absence of clinical signs of the disease.

I have applied the reaction to the blood serum of 400 patients in the asylums of the Metropolitan Asylums Board who were suffering from various forms of congenital mental deficiency. The technique I employed was the one now used by McIntosh and Fildes at the London Hospital, and differs from the one described in their book [2] only in slight variation in the dilution of the reagents, all the important principles of the original Wassermann technique being retained.

The antigen I employed, and for a supply of which I am indebted to Dr. McIntosh, was a mixture of 2 parts of alcoholic extract of human heart and 1 part of a 1 per cent. solution of cholesterin (Kahlbaum) in absolute alcohol. The antigen was diluted 1–24. Of this dilution 0·5 c.c. was put into each tube and to it was added 0·1 c.c. of the serum to be tested. The complement was obtained from guinea-pigs' serum and was titrated before each test. 0·5 of complement (diluted so that this quantity contained two and a half times the minimum hæmolytic dose) was passed into each tube. The tubes were then placed in a water bath at 37° C. After an hour they were removed and 0·5 c.c. of a 5 per cent. suspension of sheep's corpuscles, sensitised by three times the minimum hæmolytic dose of amboceptor, was added to each tube. The tubes were again placed in the water bath and readings were taken in an hour. The usual controls were used, and only the complete or nearly complete inhibitions of hæmolysis were taken as positive results.

Of the 400 cases tested 66 (or 16·5 per cent.) were found to give a positive result. An analysis of the various types of cases is given in the following tables.

TABLE I.—*Showing the Incidence of Positive Results according to the Patients' Ages.*

Ages.	Number tested.	Number of positive results.	Percentage of positive results.
5 years and under	49	13	26·5
6 to 10 years inclusive	53	8	15·0
11 to 20 years ,,	142	25	17·6
21 to 30 years ,,	107	16	14·99
31 to 40 years ,,	35	4	11·4
Over 40 years	14	0	0
3 to 20 years inclusive	244	46	18·8
Over 20 years	156	20	12·8
Totals	400	66	16·5

The age incidence of positive results indicates a tendency towards a diminution in the percentage of positive results in the later age groups. It will be noted, however, that there is a comparatively low percentage of positive results in the patients from 6 to 10 years of age, for which, although I have carefully examined the particulars relating to these patients, I am unable to find any explanation beyond the probable coincidence that comparatively few of the patients of these ages happened to have a syphilitic infection. If, however, the first two age groups are combined, 20·5 per cent. of positive results is found in patients from 3 to 10 years of age—a percentage which is considerably higher than in any of the other decades. In the second part of the table is shown the percentage of positive results in cases from 3 to 20 years of age, and also in cases over 20 years of age.

In Table II. the incidence is given in non-epileptic and epileptic cases. Of the epileptic cases, 56 were plegic with 16 positive results, while of the non-epileptic cases, 50 were plegic with 17 positive results.

TABLE II.—*Showing the Incidence of Positive Results in Epileptic and Non-epileptic Cases.*

	Number tested.	Number of positive results.	Percentage of positive results.
Non-epileptic	247	33	13·3
Epileptic	153	33	21·5
Totals	400	66	16·5

Table III. gives the results in plegic and non-plegic cases.

TABLE III.—*Showing the Incidence of Positive Results in Plegic and Non-plegic Cases.*

	Number tested.	Number of positive results.	Percentage of positive results.
Non-plegic	295	33	11·2
Plegic	105	33	31·4
Totals	400	66	16·5

TABLE IIIA.—*Showing the Various Types of Paralysis Amongst the Plegic Cases.*

	Number	Positive results.	Per-centage.
Diplegia	31	15	48·3
Paraplegia	44	9	20·4
Hemiplegia	22	3	13·6
Chorea and paralysis	3	3	100·0
Ocular	2	1	50·0
Juvenile general paralysis	2	2	100·0
Cross paralysis	1	0	0

It may be questioned if cases of juvenile general paralysis should be included as cases of congenital mental defect. Both the cases included in my series showed mental weakness from birth.

TABLE IV.—*Showing the Incidence of Positive Results in Special Types.*

		Number tested.	Number of positive results.	Percentage of positive results.
Hydrocephalic	Plegic	9	1	11·1
	Non-plegic	3	0	0
Microcephalic	Plegic	4	1	25·0
	Non-plegic	8	0	0
Mongols	Plegic	0	0	0
	Non-plegic	8	0	0
Epiloia	Plegic	1	0	0
	Non-plegic	6	1	16·6
Cretins	Plegic	0	0	0·
	Non-plegic	1	0	0·
Juvenile general paralysis		2	2	100·0

The word "epiloia" is used by Sherlock [3] to indicate a group of congenital mental defects, showing a condition of the skin known as adenoma sebaceum, together with certain mental features, and tuberose sclerosis of the brain and kidney. During life the cases can be diagnosed only by the skin condition and the mental symptoms, for, as a rule, the urine shows no abnormality to indicate the presence of the tuberose sclerosis in the kidney. This condition, however, has so invariably been found (post mortem) associated with the skin condition (Beresford at Darenth Asylum, Campbell,[4] Dobson,[5] Vogt,[6] and Volland [7]) that its presence may be assumed.

In Table V. the word "simple" is used to indicate the large number of cases of congenital mental deficiency which cannot be grouped under the special headings of Table IV. These cases more or less correspond with the "simple

aments" of Tredgold,[8] the "genetous cases" of Ireland, and the "residual group" of Sherlock.[10]

TABLE V.—*Showing the Incidence of Positive Results in cases of "Simple" Mental Deficiency which do not show any Paralysis.*

	Number tested.	Number of positive results.	Percentage of positive results.
Feeble-minded	7	3	42·8
Imbeciles	157	13	8·2
Idiots	103	16	15·5
Feeble-minded imbeciles and idiots	267	32	11·9

The incidence of positive results in cases similar as regards their mental condition to those in Table V., but suffering from various forms of paralysis, is shown in Table VI. :—

TABLE VI.—*Similar Cases to above (Table V.), but with Various Forms of Paralysis.*

	Number tested.	Number of positive results.	Percentage of positive results.
Feeble-minded with plegia	0	0	0·0
Idiots with plegia	47	15	31·9
Imbeciles with plegia	44	14	31·8
Feeble-minded imbeciles and idiots with plegia	91	29	31·8

Stigmata of syphilis could be distinguished in only 11 of the 66 cases which gave a positive result, and in some of these the stigmata were of a doubtful nature. Satisfactory family history could not be obtained of all the cases, but in only one case was there a definite history of syphilis in the parents. Other family histories obtained, however, were suggestive of a syphilitic infection. Unfortunately I was not afforded the opportunity of making a serological examination of any of the parents of the patients who gave a positive result, with the exception of one case, whose mother was also a patient in the asylum. The blood serum of the mother gave a very definite positive reaction. This patient has been an inmate of an asylum since December, 1911, is suffering from dementia, and during her residence in an asylum has presented no signs of a syphilitic infection. No trustworthy history of the case is obtainable.

Of the cases which gave a negative reaction, 3 showed flattening of the bridge of the nose, 1 typical Hutchinson's teeth (pegged and notched), 7 indefinitely pegged or notched teeth, and 5 suffered from keratitis.

Accepting the evidence of a positive Wassermann reaction, it would appear that at least 66 of the 400 cases I examined suffered from a syphilitic infection, but taking into account the fact that a negative reaction was found in cases which showed stigmata of inherited syphilis, it is probable that the above figures underestimate the full incidence of the infection. In the majority of the cases the infection is probably inherited syphilis, although the acquired form cannot altogether be excluded, in spite of the fact that, except in a few instances, only cases which had been under detention from before 16 years of age were examined. The frequency with which the inherited form occurs in children, as compared with acquired syphilis, renders the former more likely to be the cause of the infection.

Having obtained evidence of a syphilitic infection, the question arises as to what part this infection has played in the causation of the congenital mental defect. It seems reasonable that syphilis may interfere with the normal development of the nervous system, as it is a disease which so frequently attacks that system, without presenting any other gross clinical manifestation, especially if weakened by some other agency such as insanity or alcoholism in the parents. A pregnant woman, suffering from syphilis, has, in consequence of this infection, an impairment of her general health, and this may show itself in an arrest of the natural development of the fœtus. It is improbable, however, that under such circumstances the fœtus itself will escape infection, though this infection may be demonstrated only by an application of the Wassermann reaction. This reaction has served to explain the immunity to infection of the mother, as laid down in Colles's law, and of the child, as laid down in Profeta's law, by showing that infection is present, though latent.

It must be admitted that the results of the various workers who have undertaken similar investigations vary very considerably as to the percentage of positive Wassermann results obtained, as shown in Table VII. :—

TABLE VII.—*Showing the Results obtained by Various Workers.*

	Number tested.	Number of positive results.
Raviart, Breton, Petit, Gayet, and Cannac[11]	246	76
Kellner, Clemenz, Brückner, and Rautenberg[12]	216	8
Lippmann[13]	78	7
Dean[14]	330	51
Muirhead[15]	5	0
Atwood[16]	204	30
Thomsen, Boas, Hjort, and Leschly[17]	2061	31
Kröber[18]	262	56
Schölberg and Goodall[19]	46	15
Chislett[20]	22	11
Bayly[21]	2	2
Gordon	400	66
Totals	3872	353

Percentage of positive results, 9·1.

In addition to the above Lippmann obtained 13·2 per cent. of positive results at the Dalldorf Asylum, but does not mention the number of cases tested.

The conclusions which I consider may be reasonably drawn from the results of my investigations are: 1. That a syphilitic infection is associated with a considerable number of cases of congenital mental defect, and that in most cases the infection is caused by inherited syphilis. 2. That inherited syphilis, either by itself or in conjunction with other factors, plays an important part in the causation of congenital mental defect. 3. That in a large proportion of such cases the presence of syphilis can be detected only by an application of the Wassermann reaction. 4. That, with the possible exception of hydrocephalus, and certainly of the plegic forms, inherited syphilis is as likely to cause a simple, uncomplicated form of congenital mental defect as it is to cause any particular type. 5. That, allowing for the small number of cases available for examination, the Mongolian and epiloiac types are not commonly caused by inherited syphilis.

Antisyphilitic treatment of individuals suffering from congenital mental deficiency is not likely to be attended with any very hopeful results, unless commenced at a very early age, and there is difficulty in recognising the mental condition sufficiently early, but the recognition of inherited syphilis as a cause of this condition forms a most important factor in its prophylaxis. Individuals in whom syphilis, although present, is unrecognised and untreated, must be regarded as potential parents of mentally defective children, and it is on the Wassermann reaction that recognition of the syphilitic infection must chiefly depend. Whenever syphilis is, or might be, suspected in a pregnant woman, her blood serum ought to be tested, whether or not she shows definite clinical signs of the disease. If the reaction be positive antisyphilitic treatment should be persisted in, and the possibility of a mentally healthy child would thus be increased. Further, when a mentally defective child is born of parents who do not show signs of syphilis the test should be applied to the blood serum of the child as soon as its mental condition is recognised, and if the result be positive a further application of the test to the blood sera of the parents should be undertaken. In this way unrecognised cases of syphilis would be brought to light and modern methods of treatment could be adopted.

If some measures for the control of venereal disease were to be adopted in this country, and were to result, as I think they undoubtedly would, in a diminution of the incidence of idiocy, imbecility, and feeble-mindedness, they would, indeed, well justify their adoption quite apart from considerations of other beneficial results. This is clear when we take into account the ever-increasing burden which congenital mental deficiency imposes on the community, and the loss to the State of what might otherwise have been useful lives.

My thanks are due to the medical superintendents of Caterham, Tooting Bec, and The Fountain Asylums for making arrangements for the examination of patients in

these institutions, and to the assistant medical officers for assistance in the diagnosis of the cases. Also to Dr. H. R. D. Spitta, bacteriologist, St. George's Hospital, for facilities afforded me in carrying out the tests in his laboratory, and to Dr. E. L. Hunt, assistant bacteriologist, for much valuable advice.

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Caterham.

THE TREATMENT OF CHOLECYSTITIS BY CHOLECYSTECTOMY.

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AFTER considerable personal experience in biliary surgery I have been forced to the conclusion that nothing short of cholecystectomy effects permanent cure in the great majority of cases commonly known as "attacks of gall-stones." I am well aware that this opinion differs from that expressed in some recent surgical text-books and papers, but I cannot discount the fact that in 70 per cent. of my cases treated by incision with free drainage months or years later recurrence ensued and extirpation of the gall-bladder became imperative.

I should state that in all my cholecystostomies, in order to make certain of not leaving a calculus behind, I made it a practice digitally to explore the interior of the vesicle, combined with probing and methodical palpation of the cystic and common ducts, and, moreover, made it a rule to get my assistant to make a similar independent examination before the insertion of sutures. In connexion with this matter it may be of interest if I take the liberty of quoting from Keen's "Newest Surgery" (Vol. VI.): "The danger of re-formation of gall-stones after cholecystostomy is exceedingly small, ... and it is probable that in the majority of cases of supposed re-formation of gall-stones the stones had not re-formed, but were not all removed at the primary operation." I am unable to explain such a divergence of experience, unless by the fact that mine has been derived from work done in a damp sub-tropical climate, where resistance to microbial attack is diminished, or to some cardinal difference in appreciation of the pathology of cholecystitis and biliary calculi.

As to the statement in modern text-books that gall-stones are formed by bile infected by the presence of cocci carried by the portal vein to the liver and thence wafted in the bile stream to the gall-bladder, and that infection of the coats of the latter (cholecystitis) is "coincidental," I must express the most profound scepticism, and altogether at variance with my ideas—viz., that infection of the mucous coat of the gall-bladder is the primary factor in the pathogenesis of this affection, and that calculi are secondary concretions caused by the action of germ-laden mucus on the bile, in many respects analogous to the concretions frequently found in an infected appendix vermiformis; and that the usual militants, streptococci and bacilli coli, are conveyed directly to the gall-bladder by the lymph in mucous coats of common and cystic ducts from some focus of inoculation in the mucous membrane of the duodenum, or indirectly (*viâ* lymphatics) from some lesion in the mucous membrane of fixed and partially serous-coated portion of the transverse colon.

Having such views as to the pathology of gall-stones, and recognising the importance which lymphoid tissue bears to bacterial infection, and the plentiful supply of lymphoid elements in the wall of the gall-bag, it will not cause any surprise when I state that I am a staunch advocate of cholecystectomy in all cases in which there is macroscopic evidence of definite mural infection—change of colour and thickening. Furthermore, I consider the existence of adhesions as proof positive that not only are all the coats infested with hostile bacteria, but that the normal function of the gall-bladder has ceased to exist. Like the appendix, "once infected, always affected," the earlier such a potential germ volcano is removed, the better for the patient and the art of surgery.

When one reads some of the methods advocated for removal of an infected gall-bladder, one cannot be surprised to find that some surgeons prefer to finesse a cholecystostomy, and I am not ashamed to state that if I had had to commence the procedure with preliminary isolation and dissection of the cystic duct in many of my cases in which there were dense adhesions, accompanied with severe toxæmia, I also should have contented myself (temporarily!) with incision and drainage.

A few years ago I formed a plan of attack which has resulted in rendering removal of the gall-bladder a very simple ten minutes' performance. Making use of the Robson position, and a free vertical semilunar incision, (1) the liver is drawn forwards and upwards, a superficial incision is made with a knife along the line of attachment (generally adhesion) of the gall-bladder to the under surface of the liver, with the handle of the knife a space is rapidly made for insertion of the left index finger, and in a few moments the gall-bag is freely detached from its hepatic connexion—separation is carried right down to the level of the cystic duct. In order to control oozing a gauze pad is placed in the fossa fellea. (2) Having next carefully isolated the whole operative field with large bibules, the gall-bladder is aspirated, then seized and incised between two of Lane's forceps, the interior mopped dry, and calculi removed. The gall-bladder is then vertically split down to the level of the cystic duct by a few strokes of the knife, the tip of the left index finger is inserted into the cystic orifice, and the divided gall-bladder, with forceps attached (*vide* above) to cut edges, is gathered up firmly, in one grip, in the left hand, and pulled forwards. This manœuvre renders the operation practically a bloodless one, and greatly facilitates subsequent separation of deep adhesions and examination of ducts. (3) The cystic and common ducts are then carefully palpated with the right hand, and the tip of the left index finger removed from the opening of the former for passage of a small sound. If no calculi are discovered the tip of the finger in replaced, and my assistant applies a strong catgut ligature, just below it, around the cystic duct; this ligature generally occludes the cystic artery. The two flaps of the gall-bladder are then cut away by a few transverse snips of a scissors, about half an inch in front of the ligature.

When it is considered expedient to drain the bile-ducts no ligature is applied; the cystic artery and other bleeding points are ligated, and the edges of the cystic duct sutured to the upper angle (peritoneum) of the wound, and a small drainage-tube fixed in the duct. Before closing the parietal wound by three or four through-and-through strong silk sutures, I usually insert a large drainage-tube, which is left *in situ* (fossa fellea) for two or three days. If there is any sign of shock a rectal injection, consisting of a small bottle of good dry champagne mixed with 100 grm. of warm saline, is administered before the patient is removed from the operating table.

As to the facility of this method of cholecystectomy, it suffices to mention that I have on one occasion completed the procedure in four minutes, and in my last case, operated on on July 18th, the time occupied from the moment the knife entered the skin until the last parietal suture was tied, was nine minutes.

As to after results, my only cause for regret is that I did not adopt cholecystectomy long before.

Buenos Aires.

ETHER ANÆSTHESIA IN NOSE AND THROAT OPERATIONS.

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CHLOROFORM administered by Junker's apparatus has in the past been the recognised means of maintaining anæsthesia in nose and throat cases requiring a general anæsthetic when the operation is of some duration. Until recently we have made use of this method after first inducing anæsthesia, in most cases by nitrous oxide and ether. Although our results by this method have been fairly satisfactory, yet a definite number of these cases have given rise to considerable anxiety during the operation, and reference to the literature on the subject shows that this anxiety has been felt by many others, and not a few deaths attributable mainly to the anæsthetic have occurred in recent years.

The safety of ether in comparison with chloroform is generally recognised, and we think this comparison may be extended in these cases, even to mixtures containing small quantities of chloroform. Dr. A. G. Levy[1] has pointed out the dangers of the combined action of chloroform and adrenalin in causing ventricular fibrillation, particularly when a light degree of anæsthesia has to be maintained, as in nasal operations, with the patient in a semi-recumbent or sitting posture. We have frequently noticed rapidity and irregularity of the pulse during submucous resection of the nasal septum, where the nose has been previously packed with gauze soaked in 1 in 1000 adrenalin solution and chloroform has been administered, even after a preliminary induction with ether. We believe this combination to be a source of very real danger, and its use often to have caused unnecessary risk to the patient.

This has led us to adopt ether as the routine anæsthetic in all intranasal operations, for apart from its greater safety as an anæsthetic in comparison with chloroform, there is no increased danger in its use when adrenalin has been employed. It has been urged that ether causes increased hæmorrhage, which is particularly undesirable in nose and throat cases, but, contrary to our own expectations, such has not been our experience. We have also been impressed by the more steady and even character of the anæsthesia as compared with chloroform.

Apparatus.—The apparatus (see figure) we have employed has been a modification of the Junker chloroform inhaler to suit the requirements of ether. It consists of a glass jar with a heavy base, and fitted with a rubber cork pierced by three holes. Across the jar at about 1 and 2 inches from the bottom are fitted two circular pieces of metal gauze; through the centre of these runs a glass tube to within ¼ inch of the bottom of the jar. This tube passes through the central hole in the rubber cork, and is connected outside by thick rubber tubing with a Fletcher's foot-pump. Through the second hole in the cork a short glass tube just enters the jar and is connected by tubing with a flexible metal delivery tube. The third opening in the cork is used for refilling the jar. The delivery tube is fitted with a slightly concave plate of thin metal which can be adjusted in any position, and is designed to loosely cover the mouth and prevent the ether vapour being expired directly into the face of the operator. The jar is half filled with ether, so that both pieces of gauze are submerged. Air is then pumped through it by means of the bellows. The air bubbles are broken up in their passage through the fine gauze and a strong ether vapour is given off. If the operation lasts more than 10 or 15 minutes the jar should stand in a basin of tepid water.

Technique.—For intranasal operations our procedure is as follows. One hour before operation a subcutaneous injection of morphine tartrate gr. ¼ or ⅓ and atropine sulphate gr. 1/100 is given. About half an hour before operation each nasal cavity is packed with a single strip of one-inch ribbon gauze soaked in a solution made up of 4 parts of 1 in 1000 adrenalin solution and 1 part of a watery solution of 20 per cent. cocaine hydrochloride. Anæsthesia is induced with nitrous oxide and ether given with a Hewitt's wide-bore ether inhaler, the gauze packing being left in the nose until the commencement of the operation unless any respiratory difficulty arises, when being in two single strips it can easily be withdrawn by the anæsthetist. When the patient is fully anæsthetised he is raised to the semi-recumbent posture, a Doyen's gag inserted, and mouth-breathing established. The ether delivery tube is placed in the mouth and the metal plate adjusted to cover it, but no further anæsthetic is given until the presence of a brisk corneal reflex makes it clear that a cough reflex is also present. The foot pump is now brought into use, and a light anæsthesia maintained by its means. For throat operations the procedure is essentially similar, except that the metal plate is removed from the delivery tube. Where considerable hæmorrhage is anticipated and a tracheotomy has been done and the pharynx plugged, the anæsthetic can equally well be administered through the tracheotomy tube.

Apparatus for ether anæsthesia in nose and throat operations.

We have found it desirable to establish full ether anæsthesia before making use of the above apparatus. In operations for ethmoidal disease and antral suppuration where hæmorrhage is anticipated and the naso-pharynx is not plugged it is wise to maintain a somewhat lighter anæsthesia than that for a simple submucous resection of the septum. Where posterior ends or adenoids have to be removed at the termination of a septal operation the anæsthetic should be discontinued some three or four minutes beforehand, so that the patient may be in a condition to deal with the bleeding which is certain to follow. After operation the patient is

[1] Paper read before the Anæsthetists' Section of the British Medical Association, July, 1912.

placed on his side in bed with the head resting on a low pillow.

Results.—Up to the present we have used the above apparatus in 60 consecutive cases of nose and throat operations where a general anæsthetic of some duration was required; 43 were in hospital and 17 in private practice. Of the above—

7 were for submucous resection of the septum only.
4 were for submucous resection and removal of posterior ends.
22 were submucous resections of the septum with removal of one or both middle turbinates.
7 were submucous resections of the septum with removal of adenoids.
6 were for submucous resections of the septum with removal of tonsils, and in some cases adenoids as well. In one of these the tonsils were enucleated by dissection.
6 were for ethmoidal disease, and in one of these the antro-nasal wall was also removed.
5 were for middle turbinectomy, with removal of tonsils or adenoids as well.
2 were for œsophagoscopy.
1 was for excision of a malignant growth of the pharynx by external incision. In this case anæsthesia was maintained for one and a half hours through a tracheotomy opening. The patient, a woman aged 69, returned to bed with a pulse of 80, and made an excellent recovery.

In three of the cases a preliminary injection of morphia and atropine was not made, but it was found that much more ether has to be used to maintain anæsthesia, and the increased secretion of mucus and consequent cough were undesirable. The ages of the above patients varied between 14 and 69 years; 36 were males and 24 females. All types of patient were represented; 4 were asthmatics.

Where chloroform has been the anæsthetic employed it was our experience that post-operative vomiting frequently occurred, but in the majority of the above cases there has been no vomiting at all, and in no case has it lasted for more than one or two hours after operation. There have been no post-operative lung complications.

In conclusion, we would like to point out the following advantages in the above method:—1. Its greater safety in comparison with chloroform, especially when adrenalin has been applied. 2. The ease with which a light and even anæsthesia can be obtained. 3. The good colour and strong pulse maintained throughout the operation, and consequent freedom from anxiety. 4. Less post-operative vomiting. 5. Less after-shock. 6. The use of the foot bellows leaves the anæsthetist's hands free to adjust the head, or in other ways to assist the surgeon.

THREE CASES OF INFANTILE CONVULSIONS.

BY JAMES GILROY, M.B., C.M. GLASG.

THE first case is that of a girl aged 3 years, to which I was hastily called on July 31st. The history is as follows. The patient was put to bed well the night before, but on awaking at 7 A.M. she went into a fit. Medical assistance was sent for and arrived at 10 A.M., while she was still in that condition. I saw her at 1.30 P.M. I was informed that the child had had hot baths, &c. She was still unconscious, the breathing being jerky and rapid. The temperature was 102° F. and the pupils were widely dilated. The jaws were not clenched, so that the tongue could be looked at, but the thumbs were inverted and all the signs of clonic spasm were present. Acting on the success attending another anterior case, I injected a solution of sulphate of magnesia into the rectum. This had no effect, and was followed by a hypodermic injection of 1/100th gr. of hydrobromate of hyoscine. Cold cloths (not ice) had been persistently kept at the head. A third medical man arrived about 3.30 and advised cold pack, which was done. I noted that about 2.30 the breathing altered, becoming very rapid, strongly expiratory, and coma deepened momentarily, after which the convulsive spasm seemed to ameliorate, but consciousness did not return. About 3 P.M. I took a few ounces of blood from the right median basilic vein. Normal saline was later injected into the rectum. The child lingered till 6.30, when she died.

The next case contrasts strongly with the one indicated above. A little girl of South African nationality, aged 3 years, residing here on holiday, had a fit after being in strong sunshine. I happened to be in the neighbourhood and at once attended the case. The spasm was so marked that I placed a piece of wood between the jaws, and the rectal injection of sulphate of magnesia seemed at once to terminate the seizure.

The third case was that of a boy, aged 2 years, who had a severe seizure in bed at 11 P.M., and another practitioner and myself saw him repeatedly during the night, administering chloroform, injecting chloral and bromide of potassium, and wrapping in hot steaming blankets, all to no purpose. He died about 6 A.M. in the most severe fit I have witnessed, grinding his teeth incessantly, his veins prominent, and no sign of returning consciousness.

In giving a little careful thought to these very similar cases I have wondered if trephining the skull, carefully incising the membranes and raising them gently and letting away cerebral fluid, would not succeed. I go on the analogy of a case of stertor and profound coma in an adult where that procedure was so successful that consciousness returned before he was removed from the operating table. In these infantile cases there appears to be effusion—something that no drug can reach. The brain seems firmly gripped by some extraneous force. Why should trephining not be done? I should be grateful for an expression of opinion in this matter. Infantile convulsions is a condition we have too little real knowledge of. There is a stage in the respiration in these and many other cases I have seen where it gets, it would seem, out of all control by the brain. It runs away, so to speak, and cases will last for days in this state. Are we to stand helplessly by?

Ecclefechan.

OVARIAN CYST EXPOSED PER VAGINAM DURING DELIVERY BY A MIDWIFE.

BY D. C. KEMP, M.R.C.S. ENG., L.R.C.P. LOND.,
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THE patient, a Tamil Mahomedan woman aged 30, was delivered of a full-term fœtus on the morning of her admission to hospital, but actually before admission. The midwife relates that just before the child was born, the membranes being already ruptured, there appeared a membranous, as it seemed, presentation beside the head. She thought it was a second membrane. Whether she actually interfered with it or not is in question, or whether it was a thinned vaginal wall or not is uncertain, but the result came about that the "bag" suddenly protruded out of the vagina and was found to have a pedicle about an inch thick, the "bag" being of the size of a smallish cocoanut. The child immediately after was born and the placenta came away naturally, but the "bag" remained attached by its pedicle to the inner parts.

The patient was then brought to hospital in this state. Only a very superficial examination, and owing to the tender state of the vulva and vagina a minimum of handling of the parts, was made; it was seen that a cystic tumour was present in the appearance of a "bag." The pedicle, two and a half inches in length, could be felt to extend to as far as what seemed the anterior wall of the vagina or cervix (an erroneous conclusion), and a very patulous state of the cervix, as it was afterwards ascertained to be, gave the impression that a further cystic condition was internally extending beyond the pedicle.

The patient's general state of health being very good considering she had just been delivered, and there being no indication for immediate interference, the cystic tumour was supported on towels and wrapped around in aseptic gauze dressings to be later more carefully dealt with. Gentle irrigation with iodine solution was ordered to be given at a spot behind the tumour, where it was felt there was free egress to the fluid. The condition at this time was not diagnosed, but the possible view was that the tumour seemed to be an unusually large fibroid of the uterus or vagina (possibly), and it had become cystic to so great an extent that it was one "bag" of fluid, which had a wall so thin that at one part it had almost ruptured, and looked at this part like the very fine dark inner membrane of the tunica vaginalis in a hydrocele which one operates on and exposes just before stripping it from the scrotum.

Two or three days later, the patient being in the meantime in no pain or distress, and with no temperature or other morbid sign or symptom, the tumour was very closely examined under an anæsthetic. It was then recognised

as a cyst that had the fimbriated extremity of the Fallopian tube of the left side attached to it, showing up on its higher aspect of the cyst close to the attachment of its "pedicle," the latter being only the stretched broad ligament (left side) containing the rest of the Fallopian tube. On pulling slightly on the ligament an appendix epiploica and then a loop of large intestine showed up beside the "pedicle."

Removal of the cyst was done by ligaturing just beyond the part of the broad ligament where the fimbriated extremity of the tube was attached, the latter being included on the tumour surface, leaving the fimbriæ on the tumour and the rest of the tube on the "pedicle." Double ligaturing was done, a silk ligature all round the "pedicle" and a dual ligature through the middle of the "pedicle" enclosing each half of the latter. The intestines were put back, and then the stump of the broad ligament was replaced to the posterior fornix whence it had emerged. The rent in the posterior fornix was to the left of the patulous cervix. The fornix was first gently irrigated, and then the region as well as the rest of the vagina was plugged with gauze soaked in iodoform and glycerine. This was left in for about 20 hours and renewed regularly. The patient recovered and was discharged from hospital about two weeks later quite in normal health, with the vaginal rupture healed.

The above case was under my care on July 13th last, and the several conditions described were also observed by Lieutenant W. C. Paton, I.M.S., who kindly assisted me during the operation I conducted. I should mention that the rupture (or "wound," if it was inflicted by the midwife?) in the posterior fornix was oval in appearance and about two inches or more in length, and stretched out by the presence of the contained broad ligament "pedicle" and the intestine. The tumour itself was just one oval membranous "bag," and the cyst, including its fluid content, weighed 1 lb. 10 oz.

Trichinopoly.

Reviews and Notices of Books.

The Pituitary Body and Its Disorders: Clinical States Produced by Disorders of the Hypophysis Cerebri. By HARVEY CUSHING, M.D., Professor of Surgery, Harvard University. With 319 illustrations. London and Philadelphia: J. B. Lippincott Company. 1913. Pp. 341. Price 18s. net.

THIS handsome volume from the accomplished pen of Dr. Harvey Cushing appears very opportunely. The medical profession is now, we believe, thoroughly alive to the importance of the early recognition of ductless gland disorders. Such terms as dysthyroidism have gained a wide publicity, while various syndromes associated with disturbance of one or other of these glands are steadily becoming more defined and therefore more familiar. Yet in many cases it is probable that, as far, for instance, as the thyroid is concerned, mild functional disturbances of the gland escape recognition. This is undoubtedly still more true of the pituitary body. It was, therefore, highly desirable that a *revue d'ensemble* of the subject should be forthcoming, for it is one which concerns neurologist, ophthalmologist, gynæcologist, surgeon, and general physician alike.

Professor Cushing's book is a model of scientific exposition. Experimental data (of which Professor Cushing's own contribution forms no insignificant part) and clinical evidence are coupled with the results of surgical interference (and here again the writer's own experience has been utilised to great advantage) to produce a work which, however far from approaching finality, will remain a solid and authoritative contribution to our knowledge of an extremely important group of diseases. The opening chapters on the anatomy and experimental physiology of the hypophysis are short but instructive. The greater part of the volume is taken up with a consideration of the clinical manifestations of disordered function of the gland, and five types are provisionally distinguished: (1) cases of dyspituitarism in which not only the signs indicating distortion of neighbouring structures but also the symptoms betraying the effects of altered glandular activity are outspoken; (2) cases in which the neighbourhood manifestations are pronounced but the glandular symptoms are absent or inconspicuous; (3) cases in which neighbourhood manifestations are absent or inconspicuous, though glandular symptoms are pronounced and unmistakeable; (4) cases in which obvious distant cerebral lesions are accompanied by symptomatic indications of secondary pituitary involvement; and (5) cases with a polyglandular syndrome in which the functional disturbances on the part of the hypophysis are merely one, and not a predominant feature of a general involvement of the ductless glands. Professor Cushing is at pains to point out that we are still so far from a complete knowledge of the various clinical syndromes definitely referable to disordered function, in excess or defect, of one or other lobe that the purely clinical subdivisions he gives, admittedly provisional, are at present the most practical.

Much in the book, though not established, will be found by the reader very stimulating and suggestive of further lines of research; for, however hypothetical some of the author's conclusions may be, the documentary value of the cases is high, and the tabulated results of his surgical experiences are truly remarkable. The illustrations are excellently reproduced, while the type is clear and readable. There is a good bibliography and a sufficient index. We feel confident that all who read this volume will admire the conspicuous ability with which a vast amount of clinical material is handled, and none can fail to profit by a perusal of its lucid and interesting pages.

Tuberculosi ed Evoluzione Sociale. By G. SANARELLI, Professor of Hygiene in the University of Bologna. Milan: Fratelli Treves. 1913. Pp. 334.

THIS interesting volume is a study of the behaviour of tuberculosis under differences of climate, country, and race, with a view to showing how this disease obeys the same immutable laws which in nature regulate all biological phenomena.

The author's object is to prove that the fear lest the future of the human race should be for ever threatened by the scourge of tuberculosis is unjustified and unfounded. He starts, therefore, with such facts as that the rural population, though physically more robust, succumb more easily to tuberculous infection when they immigrate into towns than do the inhabitants of those towns, as shown by the statistics of phthisis among Italian and Irish emigrants into the United States. It is always the delicate rural susceptibility which presents the maximum tuberculous vulnerability in contact with bacillus-laden urban surroundings; it is always the new and hitherto exempt elements collected from the country which furnish the largest contingent in epidemics of large centres, and which act in their turn as the most powerful agents for the dissemination of tubercle, when they return to be cured or to die in the land of their origin.

Professor Sanarelli is a firm believer in hereditary immunity and latent immunisation of infectious diseases and the immunity conferred on the human organism by localised tubercle. In support of his contention he refers especially to the relative infrequency of tuberculosis in the Semitic race. Jews, as a rule, do not possess a very robust physical constitution, and their chest capacity is for the most part small, so that physically they should be considered as predisposed to lung disease in general and especially to phthisis. Nevertheless, it is rare to find among them cases of acute miliary tuberculosis, "galloping consumption," or specific lesions with high fever and rapid diffusion. On the contrary, tuberculous processes in Jews almost always assume a behaviour so chronic and torpid as to allow a very large number of

them to follow their usual occupation without much difficulty or distress. There was a time when also the Jews, led by their favourite and special occupations to establish themselves in the cities of the East and to concentrate in every metropolis, had to pay a heavy tribute to urban tuberculosis, but the uninterrupted continuance for generations in crowded and bacillus-laden surroundings has produced after eighteen centuries, independently of any ethnical factor, a true immunisation of the race which in the present day is seen in their relative freedom from phthisis in the midst of large agglomerations of human beings.

To come nearer home, Professor Sanarelli finds no relation between the diminishing mortality from phthisis in London and its improved water-supply or its temperance legislation, which, though perhaps slightly increasing the number of abstainers, has not prevented the number of deaths from alcoholism being more than doubled in the last 50 years. He furthermore considers that neither have pauperism and chronic destitution exerted any influence on the smaller death-rate from tuberculosis, which he attributes in a large measure to the gradual concentration in manufacturing cities, which favours in the long run tuberculous involution. The increased tubercle mortality in Ireland, on the other hand, is a confirmation of the biological laws which govern the evolution of tuberculosis—namely, that such increase is inevitable among any agricultural or pastoral population which is brought more and more into contact with countries or centres of more advanced social development by means of emigration, industrial and commercial expansion, urbanism, or increased facilities of communication. Professor Sanarelli characterises as cruel the theory of hereditary family predisposition, which is supported neither by experimental facts nor practical observation, and affirms that what is transmitted is not the predisposition but gradual resistance and progressive immunity. If, he argues, the offspring of phthisical parents seem so frequently to be more susceptible to tuberculosis, it should not be attributed to hereditary specific predisposition but to the original susceptibility of the parent stock which has not yet undergone sufficient immunisation in spite of living and multiplying in bacillus-laden social surroundings. The older observers believed only in heredity, but modern observers have come, little by little, to believe only in the action of the contagion. The author thinks that Landouzy's theory of specific, and that of Calmette of generic, hereditary predisposition can be reconciled in the theory of hereditary immunity, which is more in accordance not only with the facts of everyday life, but also with modern knowledge based upon experimental data, and which at the same time gives a more harmonious and rational explanation of antituberculous protection. While admitting that the prophylaxis of tubercle must consist principally in spacious and not overcrowded habitations and the organisation of garden cities, he urges that we must not lose sight of what is possible in the way of individual protection. Persons "predisposed" may be tubercle carriers, susceptible of cure and of auto-immunisation.

In conclusion, Professor Sanarelli pleads for the preservation of the young, instead of concentrating too much attention on the cure of the adult, for open-air life for infected and dystrophic children in order to reduce to its lowest figure the legion of those predestined to phthisis.

A Laboratory Guide to the Study of Parasitology. By W. B. HERMS, University of California, Berkeley. New York: The Macmillan Company. 1913. Pp. 72. Price 3*s.* 6*d.* net.

THIS little book is practically a synopsis of a series of laboratory demonstrations or exercises on the subject of animal parasites and biting insects. Bacteria are not included, hence the title parasitology is unduly extensive. After an introductory section on the nature of parasites—in which we find the unusual definition of facultative and obligatory parasites as those which respectively can and cannot change their hosts by attacking more than one species—we are introduced to the subject of the carriage of disease by insects and to a course of work on the mouth-parts of such insects as flies, horse-flies, mosquitoes, and so forth. Then the internal anatomy of such insects is considered, and afterwards other parasites, such as fleas, lice, ticks, and mites, are reviewed. Stinging and venomous animals (spiders and scorpions) are briefly dealt with, and finally in this first section, on Medical Entomology, are included protozoa, such as amœbæ, trypanosomata, and malarial organisms. The second section of the book deals with "worms" of all kinds, and a third part (four pages) is devoted to exercises on the life-histories of flies, fleas, and mosquitoes. There are no illustrations and no index, and the book seems to form a guide to the teacher in arranging a course rather than to the student. Our copy is defective in that pp. 2 and 3 are printed in place of pp. 22 and 23, pp. 14 and 15 in place of 26 and 27, and pp. 10 and 11 in place of 30 and 31.

Hæmocytes and Hæmic Infections: A Handbook for Students and Practitioners. By FREDERICK W. E. BURNHAM, M.D., C.M., Winnipeg, Manitoba. London: H. K. Lewis. 1913. Pp. 462. Price 25*s.*

WE are rather in doubt as to the attitude to be taken up towards this book. The author in a modest preface speaks of it as making a beginning only with the subjects of which it treats, with no pretension to being a complete treatise. We are inclined to think that he is an enthusiast in photomicrography, and that having made good use of unusual opportunities in the way of material he has compiled this book rather as a means of publishing the resulting photographs than for the sake of the letterpress appended to them. The latter is, however, readable and clear, if neither deep nor novel. The illustrations exhibit the characteristic limitations of photomicrography; some of them are very successful, especially considering the high magnification employed (3000 diam.), while others can be described only as melancholy smudges. The series includes the cells found in the blood both in health and in disease, bacteria which may be present in the circulation, protozoan parasites found both in man and in animals, and the various kinds of filariæ. In the compilation of the text commendable research has been made into the literature of the subject and the names of the observers of different phenomena are given, but not the references to the original papers. There is an index to the illustrations and to the subjects dealt with. We do not know why *Trypanosoma granulosum magna* (*sic*) should thus enjoy both genders simultaneously, or why infection through the skin should be termed *per cutaneam* and not *per cutem*, if a Latin phrase is necessary.

The Stomach and Œsophagus. By ALFRED E. BARCLAY, M.A., M.D. Cantab., &c., Medical Officer to the X Ray and Electrical Departments, Manchester Royal Infirmary. London: Sherratt and Hughes. 1913. Pp. 126. Price 7*s.* 6*d.* net.

THE work of Dr. Barclay in the diagnosis of disorders of the digestive system is favourably known. This volume is in essence a thesis for the degree of M.D. at Cambridge, but the original work has been amplified to bring it into accord with our present knowledge of this very interesting and important line of investigation.

We would draw attention to a point in regard to the preparation of the patient to receive a bismuth meal. The author's directions are that the digestive tube should be as empty as possible before the bismuth meal is given, and in this we agree, but this is not the general practice,

and frequently the bismuth meal is given an hour or so after ordinary food. This latter method is almost certain to give rise to appearances that have no real existence, and so to vitiate the conclusions drawn. The chapter on œsophageal obstruction is very complete, and probably in no other class of disorder does the advantage of the X ray method of examination stand out so brilliantly. In the stomach the shadows are less well defined and more complicated, with a correspondingly greater margin for error. The chapters on the stomach form the greater part of the work, and a most interesting section is a supplementary chapter on the etiology of gastric ulcer, where the views put forward by the author are ingenious and suggestive. There is also a chapter on the small intestine, including duodenal ulcer. A tabulation of cases and an exhaustive bibliography complete the book, which is one that should be in the hands of all radiologists, while general physicians would find its lessons of service.

Operationen am Ohr. Die Operationen bei Mittelohreiterungen und ihren Intrakraniellen Komplikationen. Für Aerzte und Studierende. Von Dr. B. HEINE, a.o. Professor und Direktor der k. Universitäts-Ohrenklinik und Ohrenpoliklinik in München. Dritte, neubearbeitete Auflage. Mit 29 Abbildungen und 7 Tafeln. Berlin: S. Karger. 1913. Pp. 232. Price 8.80 marks.

IT is seven years since the last edition of Professor Heine's work on the operations for the middle ear was published. This issue is admirably illustrated, well printed, and on good paper, and is a book which will be useful to specialists, though it is scarcely one to recommend to those practising general medicine who do not propose to perform aural operations. Professor Heine has brought his work up to date in every way, and as an example of the thoroughness with which the work is carried out it may be mentioned that the directions even for the administration of the anæsthetic are given. As is still too common in German books, there is the minimum amount of credit given to English workers; in fact, we have to make a fairly careful examination of Professor Heine's book to find any reference at all to an Englishman. This, however, does not detract from the merit of the book as a work on operations, however irritating it may prove to our sense of fairness.

Die Pathologie und Therapie der Plötzlich das Leben gefährdenden Krankheitszustände. Von Sanitätsrat Dr. RICHARD LENZMANN (Duisburg). Third edition. Jena: Gustav Fischer. 1913. Pp. 664. Price 12.50 marks.

IN this work Dr. Lenzmann considers at length the pathology and treatment of those diseases and conditions which develop suddenly and tend to prove dangerous to life. The fact that although the first edition was published only in 1907 a third edition has been found to be necessary is sufficient to prove that the book has been well received by German readers. The subject is an interesting one, and has been more fully discussed by French and German observers than by physicians and surgeons in this country. Nevertheless, it is of course of the utmost importance that a practitioner should be fully acquainted with those conditions which are likely to prove suddenly dangerous to life. The differential diagnosis and the therapeutic measures which should be at once adopted are to be found in the various medical text-books arranged under the systems they affect, or in works dealing with medical jurisprudence, but to arrange for the consideration of such morbid states in one volume is an excellent plan, as being convenient both for instruction and reference.

The first section of the book deals with those diseases of the brain and nervous system which prove suddenly dangerous to life. The morbid processes which cause sudden loss of consciousness are first described, including embolism and thrombosis of the cerebral vessels, heat-stroke, inhalation of irrespirable gases, and also unconsciousness occurring in connexion with the infectious fevers. Then follows a consideration of those conditions which produce pressure on the brain, and of certain inflammatory disturbances, such as the various forms of meningitis. Under a separate heading is found a description of epileptic and other forms of convulsions. In the second section those diseases of the respiratory tract are described which produce alarming symptoms. Affections of the circulatory organs, of the digestive tract and of other abdominal organs, of the urinary organs and the reproductive organs, are duly discussed, and, finally, acute poisoning by mineral and organic substances receives due notice.

The whole book is well written, and the portions dealing with therapeutics are particularly worthy of attention.

Diagnosis of Bacteria and Blood Parasites. By E. P. MINETT, M.D. Brux., D.P.H., D.T.M. & H. Camb., M.R.C.S. Eng., L.R.C.P. Lond., Assistant Government Medical Officer of Health and Bacteriologist, British Guiana. London: Baillière, Tindall, and Cox. 1913. Pp. viii.–80. Price 2*s.* 6*d.* net.

IN presenting this extremely useful small book to students and members of the medical profession who desire only a working knowledge of a subject of the greatest importance the writer has condensed the really essential points of practical bacteriology and blood parasitology into the smallest space possible, and has so arranged it that easy reference may be made to it in laboratory work. Sections are also devoted to the Wassermann reaction, Widal's reaction, the opsonic index, the tuberculin reaction, and Calmette's reaction. Some concise and up-to-date notes of many of the more important causal factors of tropical disease are also included. The handbook is printed in good type and the various subjects are clearly set forth and well indexed.

Die Morphologie der Missbildungen des Menschen und der Tiere. Herausgegeben von Dr. ERNST SCHWALBE, Professor an der Universität Rostock. III. Theil. *Die Einzelmissbildungen.* X. Lieferung. Anhang. 2 Kapitel. *Gewebsmissbildungen.* Von G. HERXHEIMER. Mit 34 Abbildungen im Text und 6 farbigen Tafeln. Jena: Gustav Fischer. 1913. Pp. 51–266 and 6 plates. Price 15 marks.

To no one more apt or competent could the difficult subject of malformations of tissues—almost a new subject—have been entrusted than to Dr. G. Herxheimer. His researches on elastic fibres early showed his acuteness in the study of tissues.

Roughly the text is divided into two parts; the first or more general part occupies pp. 51–126, while the remainder of the text may be called the special part. In the first part such questions as what are the conditons which lead to malformation of tissues and the general relation of tissue malformation to tumours are discussed. In the special part the author shows the application of these questions and illustrates them by reference to the female and male sexual organs, to the urinary organs, and to what he calls other organs and organ-systems. Under the general causes the author deals first with the combined action of chemical and physical factors, and then with the conception of so-called metaplasia—a term introduced by Virchow in 1871. A quite interesting chapter is the account of the relation between disturbances of development, embryonic residues, and tumour formation—a doctrine associated with the name of Cohnheim. The author cites the views of Ribbert, Albrecht, Beneke, Borst, and Meyer in a chapter which will interest both clinician and pathologist. Having cleared the way and examined generally the causes

and theories relating to tissue malformation, the author proceeds to illustrate his subject by an elaborate account of Robert Meyer's work. He begins with the female sexual organs, and devotes to them about 30 pages, including a copious bibliography. To the male generative organs about 30 pages are given; to the urinary apparatus another 40 pages; while the remaining 40 pages are devoted to all the other organs, as it were, in one comprehensive sweep.

It is impossible in the space at our disposal to do more than broadly indicate the wide scope of this the tenth part of the standard German text-book on malformations. Most certainly anyone wishing to refer to any malformation will find some reference to it in one or other of the now numerous "Lieferungen" of "Die Morphologie der Missbildungen," so ably, patiently, and sedulously edited by Dr. Ernst Schwalbe, of Rostock. The illustrations are both numerous and convincing. The coloured plates illustrate more especially the histological malformations found in connexion with the kidney.

LIBRARY TABLE.

Military and Tropical Hygiene at the Fifteenth International Congress of Hygiene.—A collection of papers read by officers of the Medical Corps of the United States Army at the International Congress of Hygiene in 1912 provides in less than 200 pages a practical manual for dealing with the prevention of nearly all the important affections met with in camp life in hot climates. Three articles deal with typhoid fever prevention. Antityphoid vaccine is employed systematically in military practice, 18-hour agar cultures being used in preference to broth. Severe reaction occurs in only 3 per 1000 cases on first inoculation, and in 1 per 1000 after the third dose. As an illustration of its protective value a comparison is given of the typhoid incidence in the Jacksonville Camp during the Spanish war in 1898 (when among 10,759 troops there occurred certainly 1729, and probably 2693, cases of typhoid) with the condition in 1911 at the San Antonio Camp (when among 12,801 troops there occurred one case). After a survey of the effects of inoculation in various armies, Major Russell concludes that inoculation "has proved its value in every army in which it has been given a thorough trial, and to it alone should be credited most of the improvement in the morbidity and mortality of typhoid in these armies." The vaccine used by the United States Medical Corps is an agar culture, killed at 53°–54° C. The United States Army has the unenviable prominence of leading the armies of the world in the amount of its venereal prevalence. This, however, is considered by Major Howard to be more apparent than real, and now that bimonthly inspections have been sanctioned, it is believed that reduced venereal rates will result. Since August, 1911 a system of prophylaxis has been introduced, the essential part of which is "mandatory personal disinfection following exposure." At the Jefferson Barracks recruiting depôt the venereal admission-rate has been reduced from 318 per 1000 in 1910 to 154 per 1000 in 1912; comparing fresh infections, these were reduced from 227 per 1000 to 63 per 1000. Argyrol in 20 per cent. solution has been used as the urethral disinfectant. The control and eradication of hookworm disease (uncinariasis or ankylostomiasis) is dealt with by Major Bailey Ashford, who has had much experience of this affection in Porto Rico. In this island the total death-rate is only half what it was before "anæmia dispensaries" were started, and the disease has been so greatly reduced that it was estimated that the total number of cases in the island is now not more than 100,000 (compared with over 500,000 in 1904), of which not more than 10 per cent. are severe (compared with 30 per cent. formerly). Prevention of skin infection (ground itch) is the main point. This has been carefully carried out; but after a practice march in 1910, out of 250 men there were 55 found to be affected with ground itch. On fæcal examination 33 were found to have been infected for some considerable period, ova of Necator americanus being already present in the stools; of the other 22 it was found that 20 gradually began to show presence of ova in the stools. Strict orders had been issued, and had been obeyed, as to avoidance of raw drinking water; also all the men wore shoes and leggings to prevent foot infection. Infection of the feet, nevertheless, did take place. It was found that during the field exercises the troops had to cross muddy lowlands, and that the muddy water had got in between the shoes and the leggings, the larvæ thus reaching the skin. The improvement in the health of the general population since the campaign against hookworm disease was started has been immense. "Scientific medicine has made a whole people 50 per cent. better physically than they were before, and has played a winning card in bringing about a 400 per cent. increase in Porto Rico commerce." Beri-beri is now generally acknowledged to be the result of an exclusive diet of over-milled or polished rice. It was eradicated in the Japanese navy and in the Philippine scouts by changes in the dietary, and the experiments of Fraser and Stanton on two parties of labourers fed on polished and parboiled rice respectively proved the point at issue. Captain Vedder believes that the most practical way to prevent the consumption of over-milled rice and make the use of under-milled rice universal is to put a tax on the former article. To be effective such a procedure must be of international application. Major Darnell, in treating the question of water purification in the field or on the march, advises coagulation with suitable chemicals, as employed by the Japanese in Manchuria (an aluminous or iron salt combined with a neutralising agent, such as soda, potash, or lime, producing a flocculent precipitate), followed by rapid filtration. Disinfection in the field presents great difficulties, but on occasion these have to be faced. Major Munson advocates the use of formaldehyde, and describes a portable apparatus by which efficient disinfection may be accomplished in 20 minutes. He has devised a special generator, and uses stout paper bags to contain the articles to be disinfected. Formaldehyde is best liberated from formalin by potassium permanganate, but calcium carbonate or quicklime may be substituted for the latter, double quantities being used. A high temperature (about 185° F.) is obtained, which increases the penetration and efficiency of the disinfectant and shortens the time of exposure required. The apparatus is a cylinder measuring about 8 by 5 inches and weighing only 5½ pounds. After discussing the disposal of excreta in camps, Major Ashburn concludes in favour of the deep trench latrine (6 feet) as the most convenient, safe, and practicable method, with the use of a fly-proof box seat, and the application of crude petroleum as a disinfectant or deodorant and for keeping away flies.

Diet Lists of the Presbyterian Hospital, New York City. Compiled with Notes by HERBERT S. CARTER, M.D. London and Philadelphia: W. B. Saunders Company. 1913. Pp. 129.—This is a collection of diet lists prepared for the Presbyterian Hospital, including special diets, such as "typhoid," "salt-poor," and "purin free." To these are added a number of other well-known diets such as the Lenhartz and Janeway's diabetic diets. The result is a most valuable and practical little volume which every physician would be well advised to procure.

Historical Notes on the Borough and the Borough Hospitals. By R. M. WINGENT. London: Ash and Co., Limited. 1913. Pp. 129. Price 3*s.* 6*d.* net.—This work is the outcome of some papers which appeared in their original form in the

Guy's Hospital Gazette, and the portion of it which deals with the hospitals naturally covers much of the ground taken up by Dr. W. S. Colman in his paper on St. Thomas's Hospital, which was reviewed in our issue of Jan. 4th, 1913. Mr. Wingent has collected a number of interesting and useful notes about the Borough which will be found very handy for those who have not access to the larger works which treat of Southwark and its history. Thomas Guy, if he made his money by questionable means—e.g., publishing pirated editions of the Bible and buying from navy tars their credit notes at a heavy discount, to say nothing of his gamble in South Sea stock—certainly spent it for the benefit of his fellow creatures. He presented St. Thomas's Hospital with three wards in 1707, and in 1721 began to build the hospital called after his name. He lived to see the completion of the building, but the first patient was admitted just a week after the founder's death, Dec. 27th, 1724. The bedsteads were naturally of wood, and Mr. Wingent notes that some 70 years after Guy's death, when Benjamin Harrison was appointed treasurer, one of the officials of the hospital was "the bug-catcher," whose salary (£40) was the same as that of a surgeon.

Diet in Dyspepsia and other Diseases of the Stomach and Bowels. By WILLIAM TIBBLES, M.D. London: Scientific Press, Limited. Pp. 150. Price 2*s.* 6*d.* net.—This is one of that class of brochure which has been written for both patient and physician; it is, as usual, too full and too technical for the one, and not sufficiently full and technical for the other. But its matter is sound and suitable, and conveyed in easy language.

MISCELLANEOUS VOLUMES.

A FEW heterogeneous books and reprints may be conveniently referred to here.

Digest of Comments on the Pharmacopœia of the United States of America (Eighth Decennial Revision) and on the National Formulary (Third Edition) for the Year 1910. By MURRAY GALT MOTTER and MARTIN J. WILBERT. Washington: Government Printing Office. 1912. Pp. 784.—As the title indicates, this is a digest of the literature which appeared in 1910 on the contents of the two volumes mentioned. It is the sixth of a series of similar "digests." Besides being of especial interest to all those who are in any way directly concerned in the composition and requirements of the Pharmacopœia of the United States, the book affords evidence of the thoroughness with which pharmacopœial revision in the United States is conducted.——*Provincial Hospital Pharmacopœias* (published by the *Chemist and Druggist*, London. Pp. 288. Price 2*s.* 6*d.* net) is a compilation, by permission of the respective authorities, of the formulæ for medicinal preparations used in 25 hospitals and infirmaries in Great Britain outside of London. Cataplasmata have been omitted as being rarely prepared by pharmacists. The formulæ are arranged alphabetically under groups of therapeutic preparations—e.g., misturæ, pilulæ, and so forth; the abbreviated name of the particular hospital from whose pharmacopœia each item is taken is appended. On pp. 8 and 9 mouth-washes and eye-washes are referred to respectively as collutorii and collyrii. It is to be supposed that the lack of uniformity in the abbreviated names of drugs is due to a strict adherence to the phraseology of the particular pharmacopœia quoted. Thus, on pp. 184 *et seq.*, we find sodii bicarb., sodii bic., sod. bicarb., sod. bic., sodi bicarb., and again, am. carb. and amm. carb. It would surely have been better to adopt one standard abbreviation and stick to it right through.——The National Insurance Act also is likely to be responsible for a multitude of pharmacopœias. We have already referred to one or two. The *Pharmacopœia Leodiensis*, published jointly by the Leeds Local Medical and Pharmaceutical Committees (price 1*s.* net), is good of its kind, though we observe a rather retrograde tendency towards polypharmacy. For instance, the glycerinum thymolis compositum contains 13 ingredients, the mistura bismuthi composita cum pepsino, and several others 8, 9, or 10, and the syrupus glycerophosphatium compositus (B.P.C.) 14.——*Aids to Surgery.* By JOSEPH CUNNING, M.B., B.S. Melb., F.R.C.S. Eng., Surgeon to the Royal Free Hospital and to the Victoria Hospital for Children. Third edition. London: Baillière, Tindall, and Cox. 1913. Pp. 416. Price, paper, 3*s.* 6*d.*; cloth, 4*s.* net.—In reviewing the previous edition we stated that this was an excellent product of its class, provided it be used and not abused. In the present edition much new matter has been incorporated to keep pace with the advances made in surgical science during recent years.

In *Selected Papers from the Cancer Hospital Research Institute* (London: Adlard and Son. 1913), under the directorship of Dr. Alexander Paine, are gathered together a number of interesting papers that have appeared at various dates from 1911 to 1913 in THE LANCET, *British Medical Journal*, *Quarterly Journal of Medicine*, *Journal of Pathology and Bacteriology*, and the *Journal of Physiology*. Dr. Charles Singer, studying the etiology of oral carcinoma, arrives at the conclusion that it especially affects certain types of physique, and is often associated with syphilis or gout. Mr. Arthur Foerster's paper on Wassermann's reaction in relation to cancer appeared in our columns in 1911. It is accompanied by another paper, not hitherto published, in which the value of modifications of Wassermann's reaction is considered in relation to the original method in which he concludes in favour of the latter. Dr. Alexander Paine and Dr. G. W. Nicholson, in a paper on Surgical Interference in Cancer, suggest that the occasional recurrence with increased virulence after removal of cancer is due to a favourable blood-supply for the portions left behind. Dr. G. W. Nicholson, in a paper on Transplantable Carcinoma of the Kidney of a White Rat, throws a sidelight on the origin of hypernephromata. Dr. Schryver describes a new method of readily preparing unconjugated bile acids from ox-bile in large yields. There are many other papers of interest.——Sir RICKMAN GODLEE'S *Hunterian Oration*, delivered on Feb. 14th, 1913, and published in our columns of Feb. 22nd, has been published in book form by Messrs. J. Bale, Sons, and Danielsson (price 2*s.* 6*d.* net), and contains, besides the text, portraits of John Hunter (from a drawing by Sir Nathaniel Holland, 1793), Sharp's engraving of Reynolds's well-known portrait and Hunter's death mask; portraits of William Clift, John Thomas Quekett, Sir William Flower, Charles Stewart, Arthur Keith, and the bust by Gilbert of Sir Richard Owen; also views of Leicester Fields in 1753, Hunter's House at Earl's Court (now pulled down), and the Hunterian Museum of 1800.

The problem of selecting a suitable school for girls may perhaps be rendered less perplexing by reference to *The Girls' School Year Book, 1913* (London: The Year Book Press. Pp. 664. Price 3*s.* 6*d.* net), which is the official book of reference of the Association of Headmistresses. Part I. gives a list of public schools for girls in Great Britain arranged in the alphabetical order of towns, with all details likely to interest the public and the teaching profession. The word "public" as applied to schools is used as meaning public secondary schools possessing a governing body as distinguished from private schools. Part II. deals with the future career of girls after leaving school, and contains much useful matter with regard to the various professions and the civil service. In addition there are a list of scholarships and of educational books, articles on games, and so forth.——Students who

intend taking the matriculation examination of the University of London will find a serviceable companion in the *London Matriculation Directory*, No. 64, June, 1913 (London: W. B. Clive. Pp. 205. Price 1*s.* net), which, in addition to much useful information as to courses of study, contains the papers set at the June matriculation examination, 1913, together with fully worked out solutions.

JOURNALS AND MAGAZINES.

Quarterly Journal of Experimental Physiology. Editors: E. A. SCHÄFER, W. D. HALLIBURTON, C. S. SHERRINGTON, E. H. STARLING, and A. D. WALLER. Vol. VI., No. 4. 1913. London: Charles Griffin and Co., Limited. Pp. 311–402. Price 7*s.* 6*d.*—The Effect of Pituitary Extract on the Secretion of Milk, by John Hammond. Ott and Scott, in 1910, were the first to show that injection into a lactating animal of pituitary and other extracts causes an abundant flow of milk. This has been amply confirmed. The author experimented on lactating goats. He injected 1 c.c. of extract of the posterior lobe of the pituitary body subcutaneously over the neck or shoulder. Amongst the most important results obtained were the following: The injection has an immediate effect on milk secretion, but the effect soon passes off and the daily yield is only slightly increased as a result of the injection. Histological evidence points to the direct result of the extract on the glandular epithelium. The milk is normal in composition except for a higher percentage of fats.—Vaso-dilator Axon-reflexes, by A. Ninian Bruce. Proceeding from the four cardinal symptoms of inflammation the author went on to study how the vascular dilatation present in the early stages of acute inflammation is produced—i.e., whether it is due to direct action of the irritant upon the vessels themselves or operates through a hypothetical nervous mechanism. The author experimented on the eyes of cats rendered insensitive by the application of alypin, which paralyses only the sensory endings, and, unlike cocaine, has no local action on the vessels. The author finds that the dilatation of the vessels seen in the initial stages of the inflammatory process does not occur if the region to which the irritant is applied is rendered completely insensitive by means of a local anæsthetic. It is concluded that it is due to nervous impulses proceeding centralwards, and reflected peripherally causing vaso-dilation. The centre is not situated above the cord, nor is it in the cord itself, as is found by the results of section. After analysing his several experiments, the author concludes that the result is of the nature of an axon-reflex, comparable to those already described in connexion with the sympathetic nervous system. —The Elasticity of the Hollow Viscera, by J. E. Kesson. The author worked on surviving hollow viscera and muscular tubes of the horse, ox, dog, cat, rabbit, frog, skate, &c., in varying conditions of contraction and relaxation. The tissues were kept in cooled oxygenated Ringer's fluid. The experiments were of two kinds: to test (1) the longitudinal extensibility of strips cut from the organs; and (2) the distensibility under increase of internal pressure. The elastic properties of the hollow viscera differ strikingly in the relaxed and tonically contracted states. The differences are fully illustrated by a large number of figures in the text.—The Apnœic Pause, by T. H. Milroy. By experimenting on anæsthetised cats with Meyer's pump the author was able to cause a variation in the rate and degree of distension of the lungs, as well as in the composition of the gas used for ventilation. Acids were injected into the blood during the pause and the effects observed. Amongst the results obtained are: (1) removal of vagal control does not interfere with the production of the apnœic pause; (2) any rise of the CO_2 content of the air used in ventilation shortens the apnœic pause; (3) rich oxygen-holding mixtures in the absence of CO_2 prolong the pause; and (4) acid injected directly into the carotid during the pause leads to respiratory movements of an exaggerated type. Injections into the external jugular vein are much less effective.—The Influence of Muscular Rigidity on the Oxygen Intake of Decerebrate Cats, by H. E. Roaf. The author finds that during decerebrate rigidity the oxygen intake is only slightly greater than when the muscles are flaccid.—This issue contains also a short memoir and portrait of the late Professor Gotch, one of the editors of the journal.

The Philippine Journal of Tropical Medicine. Vol. VIII. Section B, No. 2.—This number maintains the high level attained by its predecessors. Eight original articles are given, the first, which is one of considerable interest, being a joint contribution by Dr. W. E. Musgrave and Dr. A. G. Sison, of the Departments of Medicine and Pathology in the College of Medicine, University of the Philippines, on the Bone Lesions of Small-pox, with an appended pathological report by Dr. B. C. Crowell. This paper is profusely illustrated by photographs of cases and by a number of skiagrams. This is the second report on the same subject by these investigators.—The second article, on the Status Thymico-Lymphaticus among Filipinos, is from the pen of Dr. B. C. Crowell, and is illustrated by two plates.—Primary Sarcoma of the Small Intestine is discussed in a paper by Dr. R. W. Hammack, of the Department of Pathology and Bacteriology of the University of the Philippines, and Dr. José S. Hilario, of the same department, supplies a contribution on Tumours of the Pituitary Gland, with illustrations.—The Outbreak of Plague in Manila during 1912 forms the subject of a valuable report by Dr. Victor G. Heiser, Director of Public Health for the Philippine Islands, and in it he draws particular attention to the insidious beginning of the prevalence, and discusses the probable factors concerned in its origin.—The Plague Outburst at Iloilo in 1912 is also reported upon by Dr. Carrol Fox, Assistant Director of Public Health for the Philippines.—The next paper is by Dr. C. S. Butler on Some Carbohydrate Reactions of the Dysentery Bacillus, and this is followed by an article on the Isolation of Diplococcus Intracellularis (Weichselbaum) from a case of cerebro-spinal meningitis in a native of the Philippine Islands, jointly contributed by Dr. David S. Willets and Dr. Otto Schöbl, of the Biological Laboratory, Bureau of Science, Manila.—A series of experiments on the Duration of Passive Immunity against Tetanus Toxin is described by Dr. E. H. Ruediger, and the last article is one by Dr. P. K. Gilman, of the General Hospital, Manila, on Appendicitis, giving an analysis of his last 50 cases. It may be mentioned that all of the above papers were read before the Ninth Annual Meeting of the Philippine Islands Medical Association held at Manila during November, 1912.

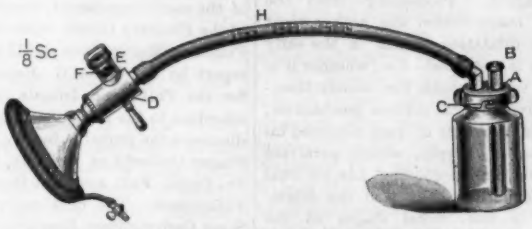
The Yellow Fever Bureau Bulletin (*including Dengue and Pappataci Fever*), Vol. II., No. 4.—This number extends to more than a hundred pages of print, and opens with a very interesting editorial in which is discussed the alleged endemicity of yellow fever in certain of the West Indian Islands. At the outset reference is made to an annotation which appeared in THE LANCET of April 19th, under the title of "Is Yellow Fever still Endemic in Jamaica?" and which dealt with a report by Captain T. J. Potter on the so-called "vomiting sickness" prevalent in that colony. Since our annotation was written, Dr. H. Seidelin, of the Liverpool Yellow Fever Bureau, has visited Jamaica and made inquiry into the above-named malady, and will present a detailed report shortly. Meanwhile it is now stated that his investigations have not resulted in establishing any identity of "vomiting sickness" with yellow fever. It appears, therefore,

that Jamaica may be regarded at present as free from the yellow fever infection, though sporadic cases do occasionally crop up, their origin in some instances being obscure and no evidence of importation being forthcoming.—The next contribution to the Bulletin is a statistical statement showing the reported incidence of yellow fever throughout the world during the year 1912, and during the first four months of 1913.—A short note is then furnished as to the occurrence of yellow fever in the Mexican city of Vera Cruz for the period extending from 1892 to 1912, and this demonstrates the remarkable diminution which has taken place in the amount of the disease there since the commencement of the anti-yellow fever campaign in 1903. In the five years 1899 to 1903 there were certified in the city 3833 cases and 1618 deaths from the disease, but in the five years 1904 to 1908 inclusive the corresponding numbers had fallen respectively to 189 and 69, while in 1909 only 3 cases were notified, and in 1910–12 not a single instance came under observation, although during the same period yellow fever was prevailing in other parts of Mexico.—A short note is also supplied relating to the anti-mosquito measures now in force in the Island of Hawaii in the Pacific.—In an original article Dr. Seidelin summarises in an interesting way the present state of our knowledge concerning dengue, discussing its symptoms, geographical distribution, etiology, pathology, treatment, and prophylaxis.—After this follows a series of short abstracts of current papers and reports dealing first with those on the mosquito question generally, and then with yellow fever, dengue, and pappataci fever.—There is also a bibliography as in previous issues. This completes the second volume of the Bulletin, and the index to it is included in the present number.

New Inventions.

AN ETHER INHALER.

THE advantages of this inhaler are: (1) Unvarying supply of vapour of any strength; (2) constant temperature of inspired air; (3) ease and safety of long-continued administration; and (4) minimum dosage with maximum efficiency and economy. To use the inhaler the glass jar is half filled with ether, and is connected by the rubber tube to the two-way valves and face-piece (see figure). The tube, B, is then adjusted so that its lower end just touches the surface of the ether, and the extra air-inlet, F, is opened wide. The face-piece is now adjusted and the patient directed to breathe quietly. While the extra air-inlet, F, is open no air should pass through the ether receiver, but as the sleeve, E, is slowly and steadily revolved to gradually close the extra air-inlet, F, the patient begins to inhale through the ether receiver. It is important to see that the tube, B, only *touches* the surface of the ether at first, as, should it be much below the surface level before the inlet, F, is closed, the patient will receive the ether vapour unevenly, which will probably give rise to coughing and discomfort. The closing of the inlet, F, should be completed in about four minutes, and the tube, B, should then be gradually immersed to the depth of about 1 inch, the whole induction period taking about 8 minutes. When the stage of surgical anæsthesia has been reached the tube, B, may be gradually raised until the depth necessary to maintain anæsthesia has been determined. Extra air may, when necessary, be given at F, and should the patient require a stronger vapour than can be obtained by sinking the tube, B, to a depth of 1½ inches, the lower third of the ether receiver may be immersed in water at body temperature. The facepiece must fit perfectly, and a small dental prop between the back molars is recommended. Fresh ether, when required, is poured down the tube, B, through which oxygen may also be administered. I strongly recommend that until the anæsthetist is familiar with the working of the inhaler the induction of anæsthesia be secured by some well-known method, a change being then made to the inhaler, which should have the inlet, F, closed, and the tube, B, immersed to a depth of 1 inch. In all cases where not contra-indicated a scopolamine injection greatly adds to the comfort of the patient and the ease of inducing anæsthesia.



A, Sleeve, in which the metal tube, B, slides up and down with very little friction. C, Air-tight bayonet joint uniting the cap to the glass bottle. D, Metal piece carrying inspiratory and expiratory valves. E, Revolving sleeve on the side of the expiratory valve, which opens and closes an extra air-inlet, F. H, Length of wide-bore rubber tubing.

The inhaler has been made for me by Messrs. Down Brothers, St. Thomas's-street, London, S.E.

L. T. RUTHERFORD, M.R.C.S. Eng., L.R.C.P. Lond.
Exeter City Asylum.

A NEW ACTINOMETER.

MEASUREMENTS of the intensity of light are desiderata in various questions of medical interest, such as the natural or artificial illumination of apartments, temporary blindness caused by intense glare in some industrial processes, estimation of sunshine as one of the factors on which climate depends, and the comparison of sources of light in photo-therapeutic appliances. Where nothing more is required than to ascertain the relative brightness of two sources of light, Bunsen's well-known grease-spot photometer is at once simple and serviceable, but many others have been devised for special purposes. In a recent issue of the *Deutsche Medizinische Wochenschrift* Dr. Hans L. Heusner, of the Dermatological Polyclinic in the University of Giessen, has described an instrument, the action of which depends on the blackening of sensitised paper exposed to light for a known period of time, and is therefore specially adapted to light of short wave-length, such as the violet end of the spectrum and the ultra-violet rays. Many years ago Bunsen and Roscoe introduced an actinometer of this kind, their unit of comparison for the various shades of the blackened paper being a mixture of 1000 parts of oxide of zinc with one part of pure lampblack. Dr. Heusner's instrument is a combination of a stop-watch and mechanism for the automatic exposure of sensitised paper. When the watch is started a shutter in the light-tight receptacle for the paper is opened and the paper is exposed until the watch is stopped. During exposure the paper and Bunsen's unit tint above mentioned, or some known multiple of it, are viewed simultaneously through a pane of yellow glass, and the watch is stopped when the shades of darkening coincide. To obtain numerical results a scale of known multiples of Bunsen's unit has been constructed, and the number corresponding to the tint used in the actinometer is divided by the time expressed in seconds. Arrangements are also provided for cutting off special parts of the spectrum. Ordinary colourless glass stops the ultra-violet rays and a great part of the visible violet, whilst Zeiss's blue uviol glass absorbs the greater part of the visible spectrum, but is transparent for rays of short wave length. The stock of sensitised paper is sufficient for 16 exposures, and the measuring of the intensity of any given light occupies two minutes. Further information may be obtained from the firm of Gustav Heyde, Mathematico-Mechanical Institute, Dresden.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 20, 1913.

Legislation with Regard to Anæsthetics.

IN our brief account of the proceedings of the meeting of the British Association recently held in Birmingham there will be found a full note of the debate which took place in the Section of Physiology on the annual report of the Committee appointed by the Association to "acquire further knowledge, clinical and experimental, concerning anæsthetics—especially chloroform, ether, and alcohol—with special reference to deaths by or during anæsthesia and their possible diminution." This committee, consisting of Dr. A. D. WALLER (chairman), Sir FREDERIC HEWITT (secretary), Dr. J. BLUMFELD, Mr. J. A. GARDNER, and Dr. G. A. BUCKMASTER, was appointed four years ago, and has already issued several valuable reports. The Departmental Committee on the Law Relating to Coroners, whose important report appeared in 1910,[1] had clearly in mind, in making their recommendations, the fact that early legislation with regard to anæsthetics was universally expected, and the British Association in appointing a committee with special instruction to inform their body with regard to deaths under anæsthesia had certainly the same idea in view. The committee of the British Association reported in 1911, at the meeting at Portsmouth, in full terms upon the commonly accepted principles which control the administration of anæsthetics[2]; and while some of the various views concerning dosimetric methods that were expressed at one of the debates of the Association were seen by the public to be tentative, it was equally clear to all observant people that legislation was absolutely required in view of the dangers to which the public were obliged to submit at the hands of ignorant administrators.

The present Report of the Anæsthetics Committee of the British Association is in the form of a communication from Sir FREDERIC HEWITT to his colleagues, and does not go over any of the old scientific ground nor make any demand upon learning, either pathological or therapeutical. It is the simple story of three tragedies; three episodes of lives cut short owing to the unfortunate licence permitted at the present time to ignorant administrators of anæsthetics; three powerful arguments why the lead already given by the Departmental Committee on the Law relating to Coroners should be followed promptly. All the three fatal cases of death in association with the administration of anæsthetics which Sir FREDERIC HEWITT has brought before the British Association and the public in so prominent a manner were connected with the use of cocaine by unregistered dentists, and no doubt they were selected advisedly as showing that a local anæsthetic can in unskilled hands produce its tragedies as effectively as a general anæsthetic may. The giving of chloroform and ether is gradually coming to be regarded as the duty of a qualified medical man only, while the frank charlatan, when posing as a dentist, is beginning to learn enough about the technique connected with the employment of these drugs to know that he would be well advised not to meddle with them. Danger remains for the public so long as such persons are not legally restricted from the administration of all anæsthetics, and the report of Dr. WALLER'S committee shrewdly emphasises the fact that this danger is always present when cocaine and its derivatives fall into ignorant hands, simple as the process of administration may seem to be in comparison with the procedure when a general anæsthetic is employed. In particular it is clear that the risks of sepsis from these injections, if badly conducted or ill-advised, will necessarily escape the attention of persons who are without proper medical or dental education and training. Such education and training are required before it is possible to recognise either the results that may follow on the employment of the dirty syringe, or the disastrous consequences of dispersing by the medium of the syringe, however clean, pathogenic organisms into the general circulation.

At the conclusion of the discussion on the Report of the Anæsthetics Committee, the Committee of the Physiological Section unanimously adopted the following resolution: "That in view of the fact that numerous deaths continue to take place from anæsthetics administered by unregistered persons, the Committee of the Section of Physiology of the British Association appeals to the council of the association to represent to the Home Office and to the Privy Council the urgent need of legislation." It is to be hoped that the council of the Association, one of whose objects is "the removal of any disadvantage of a public kind," will be successful in urging the Government to introduce legislation without further delay. The question of legislation with regard to anæsthetics has now been prominent for six years at least. It has been the subject of a Home Office Departmental Inquiry, and has been thoroughly discussed by (1) the General Medical Council; (2) the Royal College of Surgeons of England; (3) the Royal Society of Medicine; (4) the British Medical Association; (5) the British Dental Association; (6) the Medico-Legal Society; and (7) the British Association for the Advancement of Science. All these bodies have reported in favour of legislation, and a draft Bill to protect the public has received the support of the General Medical Council. Differences of opinion between the members of the dental branch of the medical profession themselves, and between that branch and the medical profession as a whole, have been gradually smoothed away, in order that the Bill may receive the support of practitioners as a body. But nothing happens. Not only the medical profession, but a considerable section of the public—in fact, all the public that understands the question at issue—have been expecting legislation for the past two years on the lines suggested in the Bill, and the

[1] The report was published in full in THE LANCET, April 16th, 1910, p. 1087.

[2] THE LANCET, Sept. 16th, 1911, p. 835.

disappointment caused by the continual delay in the matter has been openly expressed. Necessary developments in anæsthetics are hampered by the repeated shelving of the measure, and our law-givers are trying the patience of the public by their repeated neglect of a pressing reform.

Anatomy at the International Medical Congress.

SOME survey of the lessons that we have derived concerning the study of anatomy and embryology from the proceedings at the recent International Medical Congress will be of value, for from it we may be able to gauge the changes that will be induced in our attitude towards these subjects. The discussions in the Section of Anatomy and Embryology were full and valuable, as may have been gathered from our necessarily condensed reports, but none the less a goodly legacy was left behind of research that remains to be done, and done quickly. It became apparent that some modifications must be made in the teaching of certain details, as well as that some new and stimulating fields of thought have been opened up.

The first and second discussions were in marked contrast, the one telling a story of great performance and the other indicating a field where most of the work remains to be performed. The first discussion upon the Excitatory and Connecting Musculature of the Heart showed the enormous amount of research carried on during the last ten years, and the variety of points of view from which the subject has been attacked. So much highly specialised work has now been accomplished that the time was most opportune for a weaving together of all the threads spun by so many different workers. The joint session of the Congress left it clear that the labours of the last decennium have marked an enormous advance in our knowledge of cardiac mechanisms; that the anatomical, physiological, and pathological conditions of the excitatory and connecting muscular system are well and surely established; that much profoundly valuable knowledge still awaits the investigator; and that help may come from a study of other more or less rhythmically contractile tissues of the body. The second discussion upon the Early Stages of the Human Ovum revealed the simple fact that we are in reality unacquainted with these early stages for the very reason that our material is so limited. Embryologists may increase their knowledge of the early stages of lower forms and so attempt to fill in the gaps of human development, and they may indulge freely in academic discussion as to which lower form should be their guide; but their real knowledge of man can only increase with the careful treatment of a great amount of material, which, falling within the province of the pathologist or the gynæcologist, is all too often discarded. It was from a study of the abnormal development of lower forms that perhaps the only really suggestive contribution was evolved, for Mr. J. W. JENKINSON, who communicated the results obtained by centrifuging frog's eggs, had approached reality, just as the chemical investigators have done in determining the factors underlying the production of abnormalities. Although a great amount of detailed labour has been perfected, the subject is still in its infancy; yet even in its infancy it gives good grounds for eliminating "amniotic bands," "amniotic pressure," "adhesions," and such like factors from our academic and practical teaching.

The third discussion on the Morphology of the Sympathetic System was one of the most fruitful. The report by Professor G. CARL HUBER went, on the whole, towards a simplification of the subject, and tended to consolidate views which, though having every scrap of evidence in their favour, are not those invariably taught in British schools or given full place in British text-books. Briefly, the teacher was armed with the knowledge that the separation of the sympathetic from the central nervous system could only be defended on the grounds that it was perhaps convenient for teaching purposes, but that the differential treatment of artificially separated portions of the sympathetic system could not be defended on any grounds at all. So far there was nothing new, nothing that stimulated thought, but rather a co-relation of ideas already well established. It was from the discussion that the stimulus and the new ideas came in the shape of a contribution from Dr. J. F. GASKELL. This paper we may single out as one of the contributions to this section which will certainly make a real difference in the trend of thought. Dr. GASKELL looked back in the study of the sympathetic system to its very first inception in the animal kingdom, and in following that sure guide—the principle of JOHN HUNTER—he learned of its function. Many lines of thought are opened out by this research, but we may speculate as to what its influence will be upon the study of the sympathetic system. It seems that we shall have to regard the so-called sympathetic nervous system of the higher animals as one of the twin offspring of a simple type of cell first found in the leeches, the other offspring being the chromaffin system, which is the source of the hormone adrenalin. Again, we must regard this system as being introduced into the animal body as a special mechanism for the proper functioning of the contractile vascular channels. When first a contracting heart appears, the simplest sympathetic system—consisting of combined nervous and adrenalin-producing units—is brought into play; and with specialisation in the higher animals the nervous and adrenalin-producing functions become anatomically separated into apparently isolated sets of organs, both of which must still be regarded as primarily associated with the vascular system. Further, although in higher animals there is an apparent separation, such separation is only anatomical, for abundant physiological evidence is forthcoming as to the interdependence of the sympathetic and chromaffin systems, and of the necessity of both of these for the proper functioning of the contractile vascular system.

From the fourth discussion on the Morphology of the Shoulder Girdle variations of opinion arose, and although the report by Professor RAOUL ANTHONY was an extremely masterly one, it was obvious that a detailed research into the comparative embryology of the clavicle would be a profitable field of investigation. Probably not till this is accomplished will any finality be arrived at. The discussion upon the Late Prehistoric Man in Britain merely revealed the fact that prehistoric anthropology in this

country is carried on in an unconnected, almost amateur, fashion. Obviously what is wanted is a coördination of effort and result, an interchange of views between the men engaged in the work, however haphazard their excursions into the field may be. Little could be learned from the discussion except perhaps that each participant had probably accumulated a valuable store of information which, when properly co-related with that gained by others, might lead to definite results. The final discussion upon Cerebral Localisation and the Precise Significance of Sulci was by far the best; and the report by Dr. ARIËNS KAPPERS and the subsequent speeches rendered it abundantly clear and certain that cerebral sulci, or brain markings, are definitely related to cerebral functions or localisations of receptive and coördinating mechanisms of the brain. The precise relation of sulci to areas varies; the microscopic boundary of cortical structure and the site of the sulcus may not accurately correspond; but nevertheless there is established a definite relation between cortical structure and cortical function which must be accepted as an axiom.

Among the subjects raised by independent papers, two stand out for their influence upon teaching and upon thought respectively. After the exhaustive studies of Professor G. S. HUNTINGDON and Professor C. F. W. MCCLURE and their schools, it must be accepted that the lymphatic system arises in the embryo as a series of tissue spaces and channels altogether separate from the vascular system. The teaching on this point might well be dogmatic. The other subject was that introduced by Dr. KAPPERS under the name of Neurobiotaxis, and in this communication a wealth of possibilities and a host of speculations and promises presented themselves. The ganglion cells which form the nuclei of cranial nerves lie scattered, often in puzzling disorder, in the brain stem; moreover, this apparently disordered arrangement varies in different animals. Motor and sensory nuclei are grouped in different combinations in different creatures. Is there any underlying order in all this, and how does it come about that ganglia occupy different positions in different species? Some years ago Dr. KAPPERS became convinced that the ganglion cells moved from one site to another, a movement not to be confused with more active change of position of cells, but nevertheless a shifting in phylogeny in a definite direction. Moreover, the phylogenic shifting takes place in the direction of the place of stimulation. Order is at once introduced into the study of these nuclei, for the very approximation of motor ganglia to incoming stimuli gives a clue as to their function. The grouping of the cranial nuclei is the securing of an effective combination of the cell stations of those impressions and those actions which are habitually coördinated in the ordinary life activities of the animal. We have recalled to our readers sufficient of the interesting and suggestive material discussed at the Congress in the Section of Anatomy and Embryology to show how much has been recently done, how much remains to do, and—which is the most important thing—how many keen intelligences are engaged in working out these difficult problems of structure and development.

Annotations.

"Ne quid nimis."

THE NEED FOR COÖPERATION BETWEEN THE BIOLOGIST AND CHEMIST.

WE publish this week an abstract of the Presidential Address delivered by Dr. F. Gowland Hopkins to the Physiological Section of the British Association. In this address Dr. Hopkins reiterates the appeal of Justus Liebig made nearly 70 years ago to chemists to bring their special knowledge to bear upon the chemistry of the animal. There can be little doubt that the value of a combination of chemistry with biology has been disregarded for too long a period, and the services which such a coöperation is bound to render to our knowledge of the great metabolic processes are only beginning to be realised. The plea therefore so eloquently raised by Dr. Hopkins in favour of the problems of bio-chemistry being attacked in conjoint earnestness by the chemist and biologist will be welcomed by all those who believe that the animal tissues are, in the main, chemical systems. It is not difficult to furnish instances illustrating how harmoniously such a coöperation would work in the interests of medical science. Often enough it happens that the trained biologist, competent investigator though he may be, fails to consummate his studies because his knowledge of chemistry is superficial; and conversely the chemist highly trained in matters relative to the nature, composition, and constitution of substances has often no fruitful suggestions to make in regard to the possible significance of his knowledge in the great life processes. It is obvious that the one thing essential to the future of bio-chemistry is the collaboration of the biologist and chemist in all the problems which present themselves. Happily, there are signs of such a collaboration being stimulated into a more lively existence, and it is safe to predict that as the union gains strength so will our knowledge of the processes concerned in maintenance of the animal economy be advanced, and our armamentarium in the treatment of disease be better equipped.

BACILLUS CARRIERS.

WE have on several occasions referred to the cases of individuals who, although themselves perfectly healthy and able to carry on their usual avocations, nevertheless harbour pathogenic micro-organisms, and may thus be the source from which a more or less widespread epidemic may arise. For instance, in THE LANCET of Feb. 10th, 1912, p. 382, we related an instance which occurred in America in which the origin of an epidemic arising in 1909 was traced to a dairyman who had suffered from typhoid fever in 1863 or 1864. Numerous cases of carriers of the bacillus of typhoid fever have now been recorded. Similarly, diphtheria carriers have frequently been observed, whilst observations have shown that the germs of cholera and paratyphoid fever may be conveyed in the same manner. There is reason to believe also that tubercle bacilli may exist for many years in the lungs of an individual who is free from symptoms of the disease. Patients are known who have had the physical signs of old tuberculous lesions in the lungs for from 15 to 20 years, and yet whose sputum, when obtainable, is found to contain the bacilli, and therefore such persons are a possible source of infection. The difficulties of dealing with carriers are very great, and the measures recently adopted with a typhoid carrier in Manchester mark a new and important precedent in this respect. A woman who lived in one of the large working-class districts in that city supported

herself by keeping lodgers. One of the lodgers developed typhoid fever. The woman was found to be a typhoid carrier. She was placed in a hospital for two months, during which time she underwent treatment with a vaccine. On her discharge typhoid bacilli were absent from the stools, but after a week a few colonies were grown, and these increased in number during the second and third weeks. The health authorities considered that she was a danger to those staying in her house, and thus she is now to be given 7*s.* a week, so that with her old-age pension she would be independent of lodgers. The proposition has naturally been made that carriers should be so dealt with that they are no longer sources of infection to the public, but the means whereby this can be done bristles with difficulties.[1] The plan adopted by the Manchester health authorities is the first attempt in this direction, and it will be interesting to watch further developments, for under the scheme adopted but little hardship is placed on the woman, yet by forbidding her to take lodgers for whom she would have to cook and generally provide service some restriction is placed on the risk of her carrying infection to others. Yet the public safety from her is only relative.

MEDICAL MEN AT THE PAPAL COURT IN THE MIDDLE AGES.

BY perusing the Introitus and Exitus registers of the Apostolic Chamber at Rome in the Middle Ages many interesting facts concerning medical men of that era may be discovered, because whenever a Pope suffered from any serious malady famous physicians and surgeons were summoned from various countries owning the supremacy of the Pontiff, and references to their emoluments appear in these records. Clement VI. was a Pope who possessed but precarious health, therefore he secured the services of several physicians. In fact, he, or his officials and advisers, endeavoured by every means to obtain the best possible medical advice. From 1342 to 1347 he had serving in his suite three physicians and several surgeons. In December, 1343, there were six physicians. Their presence is proved by payments made, though the name was not always entered when each disbursement was engrossed. The accounts of this much-doctored Holy Father, however, reveal to us the following members of the profession as attendants upon him—Stephen Seguin, John of Florence, and Gisbert de Sept Fontaines; and among surgeons were John of Geneva, Peter Ogier, and John of Parma. Subsequent to 1350 no medical attendant appears in the accounts, with the exception of John of Parma, who takes by this date the title of surgeon and was retained at Rome until Clement VI. died. Some of these men were ecclesiastics. Thus, John of Florence is said to have been a friar, and Peter Ogier was a cleric in the church at Avignon. Employment as papal medical attendant did not secure any permanent post, for the records prove that their number varies from time to time, as also do their salaries. They appear to have been sent for when required, and only retained while their services were needed. As a rule their emoluments were paid every eight weeks. The combined remuneration for three physicians paid upon March 24th, 1344, for eight weeks' duty was 81 florins 13 sous. Both physicians and surgeons received approximately similar fees of about 21 to 25 florins for each eight-week period. In 1343, when six were in attendance, the Pope suffered from some disease of the feet, and a more or less complete cure appears to have been achieved. One remedy used was sea water. Its application was advised by Stephen Seguin, and as reward the grateful Pontiff, in the following year, supplied him with 200 florins with which to journey to the French Court, and attend upon the Duke of Normandy's wife. What were the worst of the papal maladies we do not know, but gravel and purulent ulcers are mentioned. A disease of the nature of which we are ignorant imperilled the Pope's life in 1351. Finally, in December, 1352, the bursting of a tumour followed by uncontrollable hæmorrhage caused his death. In these last two years we no longer find evidence of the attendance of several physicians. Only one surgeon is referred to, and it would appear as if the papal patient had lost faith in his medical advisers.

[1] THE LANCET, Sept. 13th, 1913, p. 821.

FATALITIES DUE TO THE UNRESTRICTED SALE OF POISONOUS DRUGS IN TABLET FORM.

IN the *Australasian Medical Gazette* of August 2nd Mr. L. W. Bickle has called attention to the serious number of fatalities which have occurred in consequence of the unrestricted sale to the public of poisonous drugs in tablet form. He was hurriedly called to a child who was supposed to be choking, but found that the symptoms were due to strychnine poisoning in consequence of taking Easton's syrup tablets. A bottle of these had been given to the child to play with by a young servant girl. The result was fatal. From the medical press in recent years Mr. Bickle has collected 11 cases of poisoning by tablets, of which 10 were fatal and recovery took place with difficulty in 1. In 7 the poisoning was due to strychnine, and in 5 of these the tablets contained Easton's syrup; they probably did in the other 2. Sulphonal was the drug in 2, and veronal in the remaining 2. With one exception the cases in which Easton's syrup tablets were taken occurred in children four of whom were of ages ranging from 1½ to 2 years. The cases of sulphonal and veronal poisoning occurred in adults. This list is, of course, by no means complete. A large number of fatalities due to veronal (usually taken in tablet form) has occurred in the last few years and led to its being scheduled as a poison. The tablet is one of the most valuable improvements of modern pharmacy, but, like every thing good, is capable of abuse. The increased interest which the public take in medical matters is valuable in that it secures their coöperation with the profession in the struggle against disease, but it also has the unfortunate result of increasing the habit of self-medication for which tablets are often used.

UNSULLIED AIR AND AN ABUNDANT SUPPLY.

WE publish this week two articles which disclose cognate aims—in the one case it is the preservation of the atmosphere against smoke contamination, and in the other it is the provision of an abundant supply of air by a special process of ventilation. It must be admitted that these two subjects form in themselves a very important branch of sanitary science. The article contributed by Dr. John S. Owens, M.I.C.E., on Methods of Measuring Atmospheric Pollution by Suspended Matter, sums up the advances made by the Coal Smoke Abatement Society in the direction of revealing the nature and extent of the pollution of the air of cities by smoke, while it evidences their determination to agitate for a mitigation of the nuisance. As readers of THE LANCET will remember, we published in 1912 the results of an investigation undertaken in THE LANCET laboratory which had for its object the periodical estimation of the impurities of the metropolitan atmosphere traceable to coal smoke. The inquiry lasted a year and the results were of a very instructive kind. From Dr. Owens's paper it will be seen that the methods instigated by us have been, with some modifications, adopted by the Committee for the Investigation of Atmospheric Pollution, and have been decided on as the standard methods for use by

authorities throughout the country which are coöperating with the committee by taking observations in their respective districts. The collection of such materials will be most instructive, and this decision means that a real attempt has been begun towards relieving the atmosphere of our towns and cities of the danger, inconvenience, and nuisance caused by smoke contamination. In his paper on New Methods of Ventilation Mr. James Keith, A.M.I.C.E., M.I.M.E., a well-known authority, describes new ventilating apparatus which appears to effect a degree of efficiency of ventilation that has not been reached before. The principle is attained by the use of special fans, and therefore is based upon what is known as the plenum system, the advantages of which are fairly stated. It will be gathered from a perusal of this paper that Mr. Keith keenly appreciates the hygienic value of an abundant supply of pure air, and shows also a clear understanding of the principles involved in healthy human respiration. As we have said, these two articles have something in common, and it will be generally admitted, we think, that they deal with questions of hygiene of the greatest importance to the community.

SUPPURATIVE PERISIGMOIDITIS IN CHILDHOOD.

AMONG the various additions to our knowledge of abdominal disease for which modern surgical enterprise is responsible few are of more interest than those which relate to the acute infective lesions of the left iliac fossa. Pericolic abscess, diverticulitis, pericolitis sinistra—all these terms, unfamiliar enough a decade ago, are now in common use; and though one of them is a hybrid of the worst type, they are of value in that they express a definite set of facts in succinct form. In the *Annals of Surgery* for August there appears a paper by Professor Joseph Rauschoff, of Cincinnati, describing what seems to be a new type of perisigmoid suppuration. His first patient was a male child 3 years old, admitted to hospital after a week's illness beginning with loss of appetite and marked constipation. The bowels were not evacuated until aperients had been given in considerable doses, and this was followed on the sixth day by sharp abdominal pain with repeated vomiting, rise of temperature, and meteorism. In hospital there was very little to show what might be the nature of the lesion, though the fact that the abdominal muscles were rigid and the bowels distended, together with persistent fever and a distinct leucocytosis, hinted strongly at the presence of some inflammatory process within the abdomen. Within two or three days after admission, however, rectal examination disclosed an infiltration on the left side of the pelvis, and appendicitis with left-sided abscess was diagnosed. The abdomen was accordingly opened, and an abscess discovered in the left iliac fossa which was closely connected with a necrotic area in the wall of the sigmoid at the summit of its loop. This area was inverted, fixed with a few Lembert sutures, and covered with omentum. Drainage was established. The child recovered after a rather stormy convalescence, and left the hospital three weeks after the operation. It is particularly important to note that though the sigmoid was carefully examined no diverticula were discovered. Professor Rauschoff also reports a somewhat similar case in a little girl 9 months old, though in this instance the presence of diverticula was not excluded. There is no authenticated instance on record of abdominal suppuration in a child originating in a sigmoid diverticulum, and, indeed, the evidence in favour of the view that such diverticula ever exist during childhood is slender. It seems, therefore, that perisigmoid abscess may arise from lesions of the colic mucosa other than those connected with the formation of diverticula, and that these have to be reckoned with as possible causes of the "acute abdomen," at any rate in childhood.

THE YORK COUNTY HOSPITAL.

THE affairs of the York County Hospital during the past few months have possessed an interest which is more than local, because the whole voluntary system of hospital control is to some extent on trial. It will be recollected that in the case of the York County Hospital two resident medical officers published a series of allegations against the administration and management of the hospital which reflected upon both the governing body and the medical and nursing staffs; that a public inquiry was held into these allegations by Sir Cooper Perry; that some of them were by him found to be substantially true, some to be exaggerated, and some to be not proved; and that several reforms were suggested.[1] After the receipt of Sir Cooper Perry's report the house committee appointed a small subcommittee to consider the suggestions made and to advise upon carrying out such of them as should be approved. This subcommittee has, it appears, met a good many times and has actually carried out some of the proposed reforms, but it has not yet presented any report or given any outward sign of its activities. The consequence is that the York Labour party has threatened, pending some action by the committee, to advise the workers to abstain from contributing towards the maintenance of the institution, and the Hospital Saturday collections have fallen off very considerably, no doubt for similar reasons. At the quarterly court of governors, held on Sept. 9th, the Lord Mayor of York in a temperate speech expressed the opinion that the delay which has taken place is not in the interest of the hospital—a criticism in which we heartily concur. His lordship urged that no good would come of the policy of "smothering up" the late scandals. In thus frankly expressing what the Labour leaders in York evidently feel, and probably a good many other citizens too, the Lord Mayor shows a clearer appreciation of the true position than some of the other members of the court possess, and consequently the more weight attaches to his declaration that the hospital has really no skeletons in its cupboard and nothing to be afraid of from full publicity. He is undoubtedly right in his contention that the policy of secretiveness which the committee seems to favour is bound to excite distrust and suspicion rather than to allay it, and we are sorry to see that a good many of the governors do not take the same view. Indeed, the Dean of York, who presided at the meeting, took up an attitude which will, we fear, do the hospital little good. He regards Sir Cooper Perry's inquiry as a waste of money, and the recommendations submitted as "mere trumpery." Those who have read the minutes of that inquiry know the strict moderation and the friendly spirit in which the report based upon it was drawn up. The Dean's speech is exactly calculated to increase the suspicion of half-heartedness or supineness on the part of the committee in carrying out the suggested reforms which are being entertained. As matters stand, the subcommittee's report is promised for the next quarterly court; but it depends on decisions to be then taken whether or not it is published. In our judgment it should be made public as soon as ever it is completed, and it should be completed without further delay. Only thus will the shaken confidence of the public in the York County Hospital be restored, and to blink this state of public opinion, as the Dean and others are inclined to do, may mean grave harm to the institution. Meanwhile, the whole staff, medical and nursing, of the hospital have to carry on their duties in an atmosphere which cannot make

[1] THE LANCET, June 7th, 1913, p. 1612.

for the greatest efficiency. They are and have been, we feel sure, doing their very best since the inquiry in the interests of the patients and of the hospital. They must have passed through a very trying time during the last nine months; and their difficulties are not likely to vanish so long as any important section of public opinion remains dissatisfied with the management. So from the professional as well as from the lay point of view, the governors will be well advised to put themselves straight with the public; and that will not be done by concealment and procrastination.

THE OPERATIVE TREATMENT OF EPIDIDYMITIS.

IN the *Journal of the American Medical Association* of August 16th Lieutenant L. S. Eckels, of the Medical Corps of the United States Army, has reported most gratifying results from the treatment of acute epididymitis by epididymotomy. He describes the operation as "recently suggested," but it is a revival of a method which was practised in the pre-antiseptic period, though naturally with a much inferior technique. Lieutenant Eckels finds the relief so immediate as to render the continuance of the administration of sedatives, as well as "loathsome external applications," unnecessary. In from four to eight days the patient is able to resume his usual duties, if not too violent. Epididymotomy is an entirely rational procedure; it is an example of the surgical principle of relieving tension. The inflammation causes the secretion of a varying quantity of serous fluid by the tubular glands of the epididymis, and frequently some exudes into the tunica vaginalis, forming a hydrocele. Patients often do not come for treatment until the stage of suppuration is reached. The pus is usually confined to the intertubular connective tissue and the resulting abscess is usually small. Whatever the stage Lieutenant Eckels holds that epididymotomy is the best treatment. If performed in the early stage it prevents suppuration. The operation which he performs is a modification of that introduced by Hagner, of Washington, D.C. As local anæsthesia is considered inadvisable, a general anæsthetic is given. The scrotum may be sterilised in any satisfactory manner. Lieutenant Eckels prefers the simple method of applying a 2 or 3 per cent. of alcoholic solution of iodine after shaving and thoroughly drying the skin. The incision is made over the most prominent part of the swelling. It varies in length from 2 to 4 inches, and should be sufficient to allow of the delivery of the testicle, which is wrapped in cloths moistened with warm sterile water or saline solution. A small incision is made into the tunica vaginalis, which allows the fluid of the hydrocele to escape. Then the inflamed portion of the epididymis is punctured in numerous places with a blunt probe or grooved director. This relieves tension by allowing fluid to escape. If pus escapes an incision is made in the epididymis in a longitudinal axis to allow free drainage. If a probe is passed into the focus of pus and slight pressure made the greater part of the pus will be removed. After thorough washing of the organ with warm saline solution, a short drain composed of half-a-dozen strands of silkworm gut is inserted into the pus focus. If no pus is found drainage is not adopted. The testicle is returned to the scrotum, which has previously been cleansed with warm saline solution, the subcutaneous tissues are united by one or two sutures of small catgut, and the skin is united by silkworm gut sutures with the drain passing out at the lower angle of the wound. When the swelling is great it may be necessary to use the button suture to prevent the silkworm gut from tearing out of the inflamed friable tissues. A simple gauze dressing is applied and changed in 48 hours, when the drain is removed, if used. During this period the scrotum is supported by a T bandage. Usually only one other gauze dressing is necessary, and is removed on the fifth or sixth day following the operation, when the silkworm gut sutures are also removed. Most patients are fitted with suspensory bandages and allowed out of bed from the third to the fifth day, and return to their usual duties from the fourth to the eighth day. The immediate results of the operation are astonishing. The pain at once disappears, the swelling rapidly diminishes, and the patient is comfortable from the time he recovers from the anæsthetic. The remote results are just as remarkable; relapses never occur. The less the induration the more rapid and complete the return to normal of the size and shape of the testicle. On theoretical grounds Lieutenant Eckels thinks that sterility is less likely to follow if the inflammation is aborted by operation than if the ordinary treatment is followed. He recommends epididymotomy as the treatment of choice in all forms of epididymitis, whether due to the gonococcus or other organism, and in all cases from the mildest to the most severe.

THE CASE OF MR. H. T. HAMILTON.

THE trial of Mr. Henry Thomas Hamilton at the Central Criminal Court upon an indictment charging him with offences under the Lunacy Act, 1890, with regard to two patients under his care and with a common assault upon one of them ended, as everyone knows, with the acquittal of the accused upon all counts before all the witnesses who were present to give evidence on his behalf had been called. Mr. Hamilton is to be heartily congratulated upon this conclusion to a severe and painful ordeal. He was charged upon the evidence of a number of persons, who with regard to the scenes which they described claimed the position of eye-witnesses, with offences which owing to the helpless position of the alleged victims would have constituted serious crimes if their commission had been established, and would have shown him unworthy alike of the position of responsibility which he occupied and of the profession of which he is a member. The story of the alleged eye-witnesses to the serious assaults stated by them to have been committed upon a young girl patient was partly strengthened by her mother, who deposed to a conversation, which, if the jury had been satisfied that it took place as she described it, would have condemned the accused out of his own mouth. Of that conversation he was able to give a different version, which his counsel laid before the jury as constituting a small substratum of fact underlying a tissue of falsehoods and delusions, and this version he had given on the earliest possible occasion when the summonses in the case were first served by a detective-inspector. It was a version which, indeed, showed that Mr. Hamilton had administered corporal chastisement of the unwisdom of which he is probably now fully conscious, but which certainly did not constitute anything in the nature of the barbarous and outrageous conduct of which he was accused. We have not thought it necessary to review the facts alleged or proved in the course of a trial the reports of which, published at great length in the daily press, are fresh in the minds of our readers. Three at least of the nurses, upon the veracity of whose evidence against Mr. Hamilton the case for the prosecution most depended, were probably hostile to him personally, and had not only been heard to threaten him, but until they had left the service of the accused had made no charge against him. That Mr. Hamilton was not always fortunate in the nurses whom he selected to attend upon his patients he must himself now be fully aware, and his experience will no doubt serve as a warning to others of the scrupulous care needed in the difficult task of engaging attendants for persons mentally

deranged or enfeebled. In one respect Mr. Hamilton is to be sympathised with upon the somewhat sudden ending of his trial, in that his counsel were prepared to call a number of further witnesses on his behalf beside those heard by the jury. The jury first intimated that they were "quite satisfied that the younger patient was not certifiable as a lunatic at the time when she was in the charge of Mr. Hamilton"; and later with regard to the remaining charges of assault, and after witnesses had been called whose evidence bore upon these, they informed the court that they considered that the case for the Crown had not been made out. No publicity therefore could be given to the testimony that would have been forthcoming as to Mr. Hamilton's personal qualities.

THE NIGERIAN TRYPANOSOME OF SLEEPING SICKNESS.

IN Nigeria a form of sleeping sickness is encountered which is of a comparatively mild type, and in order to account for this mildness it has been assumed that the malady must have existed in that region for many years, and that in consequence the natives had acquired a relative immunity to the infection. It was apparent that further inquiry was desirable, and in view of this Dr. J. W. Scott Macfie, of the Lagos Medical Research Institute, undertook a series of investigations on trypanosomiasis as it occurs in Southern Nigeria. The results of this inquiry showed that the trypanosome of sleeping sickness in that part of Africa possesses some unusual morphological features which seemed of sufficient interest to be placed on record in view of the peculiar clinical characters associated with them. Dr. Scott Macfie has accordingly published his conclusions in the last issued number of the *Annals of Tropical Medicine and Parasitology*.[1] He states that he found the Nigerian trypanosome to differ in several respects from a typical strain of T. gambiense; it produces in man a form of sleeping sickness which is relatively mild, and which occurs mostly in young persons; in this form of the malady the trypanosomes appear either to be absent altogether from the peripheral blood, or are present in such small numbers that hitherto they have escaped detection; the strain, moreover, seems to be but slightly pathogenic to the smaller laboratory animals. The morphology of this trypanosome as it occurs in the blood of the guinea-pig shows some special features; the organism is smaller than T. gambiense, the cell protoplasm when well stained is homogeneous, and in the blood films there constantly appear a very few minute parasites measuring as little as 8μ in length. Some of the short, stumpy forms have the nucleus situated far forward at the anterior (flagellar) end of the body. The occurrence of a few peculiar trypanosomes which seem to have a flagellum free in its whole length is also remarkable. Considering the morphological features of this parasite from Southern Nigeria and the clinical characters of the disease produced by it, Dr. Scott Macfie is convinced that this trypanosome cannot be regarded as belonging to the same species as T. gambiense. He therefore has come to the conclusion that it must be regarded as a new species, and he proposes to give it the name of *T. nigeriense*.

REMINISCENCES OF SPA.

SPA, in the Belgian Ardennes, occupies a unique position in the literature of balneology, because its erstwhile celebrity has led to its becoming in the English language a general designation for a mineral water resort anywhere. By the beginning of the seventeenth century its two principal springs, Le Pouhon and La Sauvenière, had become well known, as appears from etchings of about the year 1620, reproduced in a history of the place given in a recent number of *Paris Médical*. Among reigning sovereigns who went there in those early days for the benefit of their health mention may be made of Charles II. of England, Henry III. of France, Christina of Sweden, Gustavus III. of Sweden, Joseph II. of Austria, and Peter the Great. Visitors of less distinction included the Duke of Northumberland and other noblemen, both English and French; Bernard de Palissy, the porcelain worker; Justus Lipsius, the Dutch critic and editor of ancient classics; St. Evremont, the French diplomatist and man of letters; and ladies of influence at the court of France, such as the Duchess of Orleans, Madame de Genlis, and Madame de Lamballe. This intermingling of the aristocracy of intellect and the aristocracy of birth made Spa during the four summer months one of the few cosmopolitan towns of Europe, and in order to lessen the probability of discords arising among these numerous visitors the prince-bishop of Liège strictly forbade the carrying of swords during the fashionable season. Through the efficacy of its mineral waters Spa secured the goodwill of neighbouring nations to such a degree that during the wars which devastated the Low Countries several princes and generals are said to have given the town special protection against excesses on the part of the soldiers. The diseases treated at Spa were of many different kinds, and from the descriptions which have been left the place of some of them in modern nosology may be identified. Drinking the waters was the only way in which they were used, the quantity taken by each visitor being much larger than nowadays; external treatment by carbonic acid baths was not employed at Spa until the end of the eighteenth century. It deserves to be remarked that the visitors' list, which has appeared regularly since the year 1751, was the earliest publication of its kind. The French Revolution and the wars of the Empire were disastrous for Spa, but with the support of the Belgian Academy of Medicine and the Belgian Government it is now to some extent regaining its former prosperity.

DEATH OF DR. EUGENE F. CORDELL.

BY the death of Dr. Eugene F. Cordell, which occurred at the age of 70 in Baltimore on August 27th, the United States loses one of its foremost historians of medicine. Dr. Cordell was a native of Charlestown, West Virginia. He graduated at the School of Medicine of the University of Maryland, at Baltimore, in 1868, where he became later honorary professor of the history of medicine. He was professor of the principles and practice of medicine from 1896 to 1904 in the Women's Medical College of Baltimore. He had been president of the Medical and Chirurgical Faculty of Maryland and of the Literary and Historical Society of the University of Maryland, and was editor of the University gazette, *Old Maryland*. His *magnum opus* was the "Medical Annals of Maryland," 1790–1899. He was the author also of a very interesting paper on the Identity of Celsus, whom he concluded to be the same Celsus of whom Horace speaks in the third epistle of the first book, addressed to Julius Florus, as well as of many other papers relating to classical medicine.

THE first Hunterian Society's lecture will be delivered in the library of St. Bartholomew's Hospital on Wednesday, Oct. 8th, 1913, at 9 P.M., by Dr. F. J. Wethered, the subject being Fever in Pulmonary Tuberculosis, its Significance, and Therapeutical Indications. All members of the medical profession are invited to attend.

THE newly constituted American College of Surgeons will hold its first Convocation at Chicago on Nov. 13th, when Sir Rickman Godlee, Bart., President of the Royal College of Surgeons of England, has accepted an invitation to confer the first Fellowships on some 1400 leading surgeons of Canada and the United States.

[1] Series T.M., vol. vii., No. 3, A.

NEW METHODS OF VENTILATION.

BY JAMES KEITH, A.M.I.C.E., M.I.M.E.

IN an epoch-making address before the British Association for the Advancement of Science held at Dundee, Scotland, during the year 1912, Dr. Leonard Hill, President of the Section of Physiology, dealt with "The Maintenance of Health," and the undernoted excerpts from his address have a considerable bearing on the ventilation of tunnels, mines, engine-rooms, workshops, and so on.

He [Dr. Leonard Hill] asked the consideration of nothing higher than a stuffy room. Everyone thought that he suffered in an ill-ventilated room owing to some change in the chemical quality of the air. The good effects of open-air treatment, sea and mountain air, were no less generally ascribed to the chemical purity of the air. In reality, the health-giving properties were those of temperature, light, movement and relative moisture of the surrounding atmosphere. The bracing effect of cold was of supreme importance to health and happiness.

The ill-chosen diet, uniformity of atmosphere—above all, the neglect of vigorous exercise in the open air and exposure to the winds and light of heaven—all these, together with the difficulties in the way of living a normal sexual life, went to make the pale, undeveloped, neurotic, and joyless citizen. The business man required a warmer atmosphere to work in; if the atmosphere was too warm it reduced his metabolism and pulmonary ventilation still further; thus he worked in a vicious circle. The open fire and wide chimney ensured ventilation, the indrawing of cold outside air—restless currents at different temperatures, which struck the sensory nerves in the skin and prevented monotony and weariness of spirit.

The efficiency of workers in mills, mines, tunnels, and stokeholds was vastly increased by the provision of a sufficient draught of cool and relatively dry air, so as to prevent overtaxing of the heat-regulating mechanism. The electric fan has vastly improved the condition of the worker in the tropics. It would pay the employer to supply fans.

All the efforts of the heating and ventilating engineer should be directed towards cooling the air in crowded places and cooling the bodies of the people by setting the air in motion by means of fans.

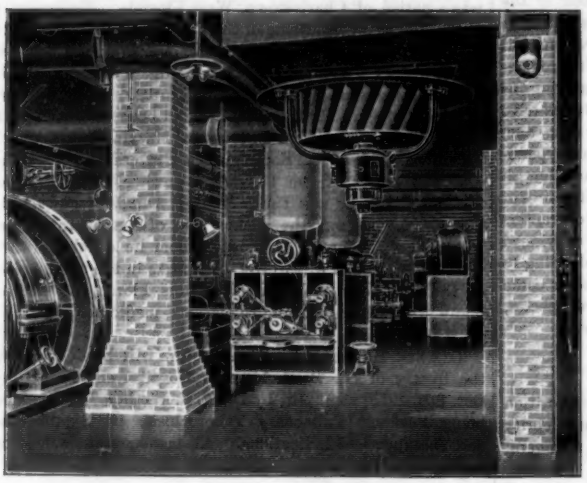
The *essentials* required of any good system of ventilation were: (1) movement, coolness, proper degree of relative moisture of the air; (2) reduction of the mass influence of pathogenic bacteria. The chemical purity of the air would be adequately ensured by attendance to the *essentials*.

There was nothing more fallacious than the supposition commonly held that over-feeding and over-coddling indoors promoted health. The two together deranged the natural functions of the body. He who sought to save his life would lose it.

These authoritative pronouncements form an ample text for this article, in which new methods of ventilation embodying the *essentials* so strongly recommended by Dr. Leonard Hill are described and illustrated.

Ventilation really means securing a change of air. Each person requires a certain amount of fresh air per minute,

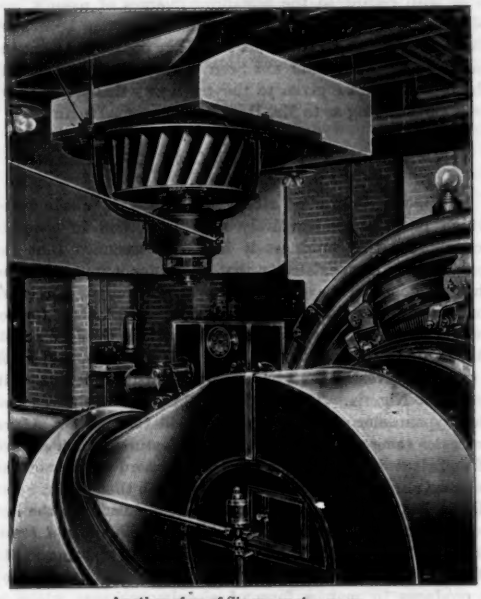
FIG. 1.



View of Singer engine-room.

and though it has been well said that pure air is as essential to health as pure water, and that man's breath is his own worst enemy by vitiating the atmosphere he breathes, the general public appear to be somewhat careless of these vital points. Fortunately, less change of air is required in rooms or enclosed places in winter than in summer, as the higher the external temperature the more air is absolutely necessary for comfort even in the open. A high authority has stated that the ideal condition of comfort and healthiness is that represented by a hillside on a still spring morning, when the sun is shining brightly and there is frost in the air; and

FIG. 2.



Another view of Singer engine-room.

though it may not be quite possible to attain altogether to this high standard in enclosed places, it is wise to strive to do so.

The value of open-air schools in the improvement in the physique of children has just been exemplified by the publication of a report from the medical officer of health of Manchester, in which it is shown that in the centre of the city the children are on an average 6 lb. lighter and 3 inches smaller than those of like years who live two miles out and have the great advantage of fresh air and sunlight. The report of the school medical inspector again states that the breathing of pure fresh air has a wonderful effect on the physical and mental condition of the child, and goes on to say that this has been proved in the open-air schools which have already been established in the country near Manchester.

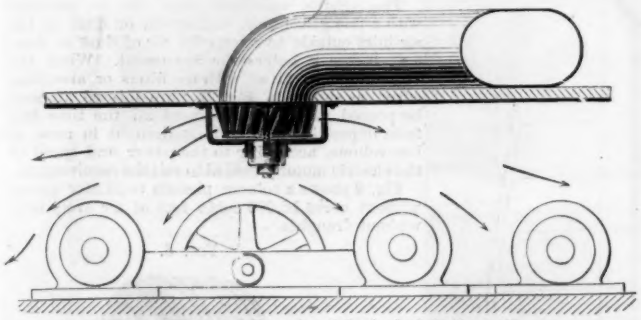
The race is to the swift. Twentieth-century knowledge has taught us that the northern races and those most given to the practice of manly open-air exercises are the healthiest and strongest, while unquestionably the dominators of the world and its trade to-day are the people who are furthest advanced in sanitary science. It behoves us, therefore, as a nation to look to our laurels and see that we continue to keep first in progression towards perfection in sanitation and ventilation. With increased facilities nowadays for the economical adoption and distribution of mechanical power by electricity there is no excuse for lack of good ventilation almost anywhere, especially where it affects innocent and confiding workers.

In keeping with the first principles already defined are the following new methods giving healthful, comfortable conditions in engine-rooms, electric power-houses, stokeholds, tunnels, railway carriages, offices, and so on.

1. *The Ventilation of Engine Rooms, &c.*

The problem of the proper cooling down or ventilation of electric power-stations, engine-rooms, and stokeholds of ocean liners, underground or "tube" railways, tunnels, &c., can be solved by the flooding of these rooms or places by fresh air in volume from the outside, under slight pressure, and without the use of air-delivery ducts inside. By the method illustrated (Figs. 1 and 2) results are obtainable so high, compared with what has hitherto been attained, that a year or so ago these would probably have been considered practically impossible. Figs. 1 and 2 show portions of the underground engine-room or power-house of the great Singer Building, Broadway, New York, United States, where three large open fans of special construction and as illustrated are installed, capable of propelling pure fresh air into the engine-room under moderate water gauge to the extent of 120,000 cubic feet per minute; or more than the whole cubical air contents of the engine-room every minute, giving a change of air contents more than 60 times an hour. The result is comfort and coolness without draughts under all outside atmospheric conditions. This method has superseded all other systems hitherto in use in the engine-room of the Singer Building, New York, and has satisfactorily solved the problem of how to successfully and economically keep these engine-rooms comfortably cool and healthy. This enormous change of conditions—viz., from an excessively high and unhealthy temperature inside, to that of a normal outside temperature—is effected by the expenditure of 22 horse-power only, when fans are running at full speed. The air displaced mostly escapes towards the floor level into the boiler-house, thus benefiting the ventilation of the boiler-house and the draught up the chimney.

FIG. 3.



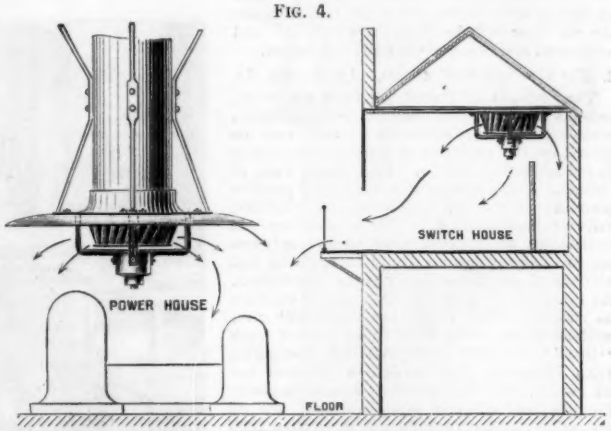
Showing the delivery and dispersion of the fresh air in the engine-room.

Great though the change of air described may appear to be, the author is convinced that instead of 7,200,000 cubic feet of air per hour, considerably more than double that volume, or say as much as 15,000,000 cubic feet of fresh air per hour, could equally successfully have been handled and distributed in the Singer engine-room, under the new method described, by means of larger inlet air conduits to the fans and larger fans (naturally requiring proportionately more power) with even increased advantage and freshness in ventilation and without discomfort.

Fig. 3 shows part section of another engine-room indicating how the fresh air may be brought up to the inlet of the delivery open fan and dispersed or distributed from fan or fans laterally and peripherally under slight pressure and without back slip. A somewhat similar application may be made in the case of a "tube" or railway tunnel station. Fig. 4 illustrates part transverse section view of a large electric power-house or station on the continent, principally showing how the long switch-house (with switch-board about 500 feet in length) has been satisfactorily cooled down from an abnormally high temperature by the new method of ventilation. In this case a series of ten open fans, each having a 25 inches diameter air-inlet and running 700 revolutions per minute, electrically driven, are installed as illustrated along the whole length of the switch-house and deliver and distribute in all 90,000 cubic feet of fresh air per minute, or 5,400,000 cubic feet per hour, as shown by the arrows, into the power-house, which means changing the whole cubical air contents of the switch-house every 40 seconds, or 90 times an hour, and reducing its inside temperature from, say, 120° F. in summer to that of nearly the normal outside atmosphere without producing unpleasant currents, for a total expenditure of 14,000 watts. The main building or power-house proper may have, as shown, similar fans of larger size arranged along its whole 600 feet length, the building being proportionally wide and high.

Fig. 5 is a transverse sectional view of engine-room of one of the great Transatlantic liners, showing the application of the new method for flooding the engine-room with cool fresh air in volume under moderate pressure drawn from the top deck in a manner and with an efficiency never before obtainable. It will be noted that the air is delivered into the engine-room by a large electrically run open fan placed at the ends of the air-shafts below, so that the full volume of fresh air, equal to about 150,000 cubic feet (more or less) per minute, is propelled and properly distributed right into the engine-room without loss from any delivery ducts. Where desirable or necessary the change of air in the engine-room may be had to the extent of 120 times its whole cubical air contents per hour without uncomfortable draughts. It will be seen that any strong wind blowing into the funnel mouth inlets on top deck naturally benefits the installation and makes the work easier for the open fan or fans below. The principle of this application is that the cool, fresh, and heavier air over the ocean (especially in northern latitudes) is *drawn* and not *forced* down from the upper deck and delivered laterally by specially designed open fans (of large peripheral area) placed as low down in engine-room as permissible, flooding the whole engine-room (to the extent already mentioned) with air, with the result that the cooler incoming air of greater specific gravity falls towards the floor, displacing and expelling the heated and lighter air contents bodily up the main hatch or hatches or other exits without the necessity for extract fans. The phenomenal success of this method of ventilation and cooling effects is well exemplified in the central turbine engine-room of the great Cunarder s.s. *Lusitania*, where last year its application was effected, with the result that the atmosphere therein has been reduced from an intensely high and unhealthy temperature to one about half the temperature Fahrenheit at most and

FIG. 4.



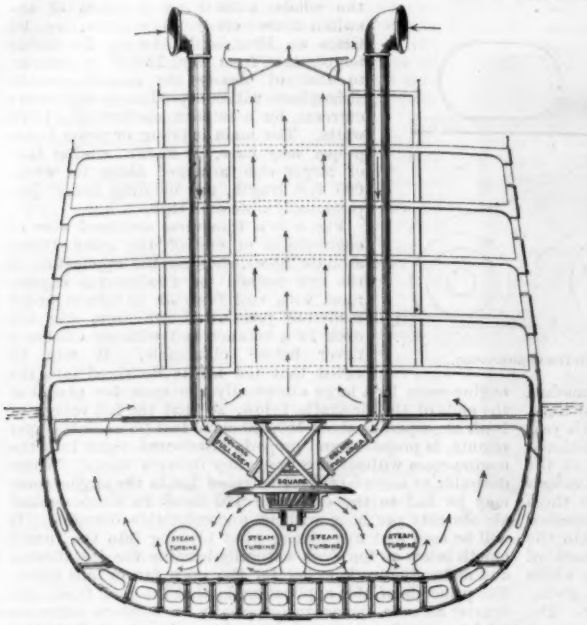
Part transverse sectional view of large electric power-house. Much reduced scale of drawing.

uniformly healthy, and that, too, without appreciable draughts. A similar result, so far only as air volume is concerned, could be obtained by blowing or forcing the same quantity of air downwards by cased fans from the top deck at an expenditure of electrical current equivalent to 1·6 carbon 8 candle-power incandescent electric lamp, or 48 watts. Where a certain degree of noise from the motor running at a higher speed is permissible (as, say, in workshops, railway carriages, &c.), over three times the amount of air may be obtained from the same size of apparatus by the use of larger motors with an expenditure of increased electrical current.

The window ventilator may also be provided with a fine gauze rainproof screen or filter on the air-inlet outside to screen the air of dust or flies, &c., before it enters the apartment. When the ventilators are fitted with fog filters or absorbing cover, as shown in Fig. 8, pure filtered air may be poured into any apartment all the time free from impurities and without draught in more or less volume, according to the power and speed of the electric motor provided to suit the requirements.

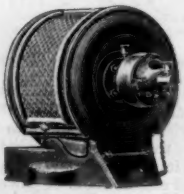
Fig. 9 shows a column plenum ventilator giving without noise 18,000 cubic feet of air every hour without draughts.

FIG. 5.



Transverse sectional view of the engine-room of a great Transatlantic liner.

FIG. 6.



Ventilator for windows, cabins, railway cars, &c.

Fig. 10 shows plenum ventilation system installed in an office, but it may be applied in other ways to suit requirements.

Fig. 11 illustrates electric plenum ventilators fitted in railway carriages, and as may be applied in cabins, state-rooms, smoking-rooms, dining-rooms, libraries, &c., in ocean liners.

at practically double the water gauge above, in order to get the necessary velocity and volume below, but the expenditure in horse power would be greater while the air distribution in engine-room could make for nothing but uncomfortable draughts. A somewhat similar installation, but on a larger and more complete scale, is at present being arranged in the great engine-rooms of the s.s. *Aquitania*, now nearing completion on the Clyde, by means of which over 16,000,000 cubic feet of fresh air per hour will be constantly supplied and circulated and changed over 100 feet below.

2. *The Ventilation of Offices, Apartments, &c.*

The problem of furnishing fresh air at all seasons in offices, bedrooms, railway carriages, tramcars, cabins, state-rooms, &c., can be solved by the provision of positive ventilation in the following manner. Figs. 6 and 7 are of different forms of apparatus for giving positive plenum ventilation, applicable to windows, railway carriages, &c. These electrical-run ventilators are *noiseless* when motors only run up to 1200 revolutions per minute, giving full volume of air for ordinary room ventilation. As installed upon the window sill of an office as shown in Fig. 7, the ventilator will give, without noise, over 6500 cubic feet of fresh "live" air every hour, without discomfort from draught; this apparatus requires but 24 watts, or 0·8 carbon 8 candle-power incandescent electric lamp current, for its operation; motor running not more than 1200 revolutions per minute.

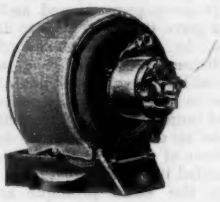
Again, in a room, say, 18 ft. in length by 16 ft. in width and 11 ft. in height, having an open fireplace or chimney exit and two windows, one of these plenum units installed as in Fig. 7 in *each* window, will together ensure a complete change of air to the extent of 13,000 cubic feet per hour, or fully four times the whole cubical contents of the room.

By the application of this system in something like the manner illustrated the whole cubical air contents of even the largest railway carriages or compartments on board ship may be replaced by pure fresh air to the extent of from five to ten times or more per hour; or by the use of several of these apparatus a crowded room or saloon, &c., may be

FIG. 7.

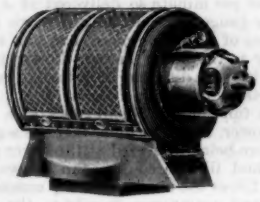
Installation of ventilator on the window sill of an office.

FIG. 8.



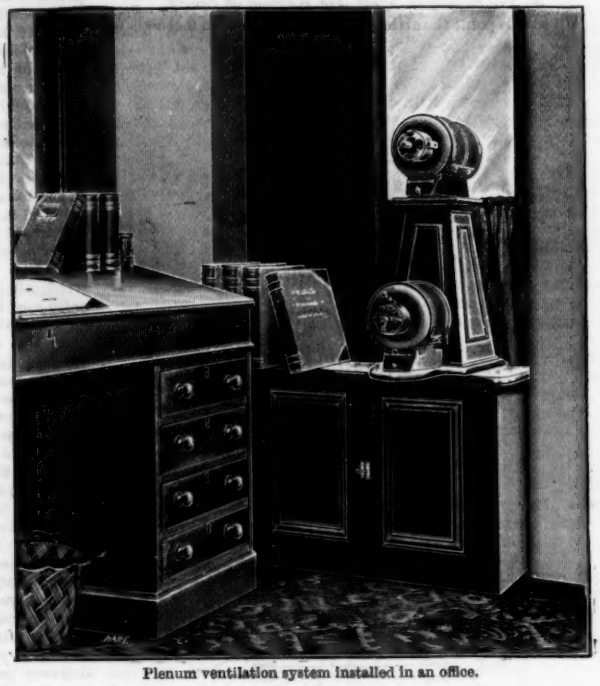
Ventilator provided with fog filter.

FIG. 9.



Column plenum ventilator.

FIG. 10.



Plenum ventilation system installed in an office.

FIG. 11.

Interior of railway dining carriage.

FIG. 12.

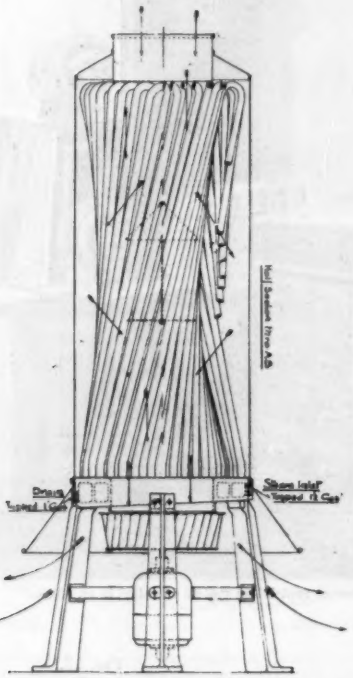
Installation for supplying cooled or warmed air. Scale: 3/16 inch = 1 foot; or about one-sixtieth actual size.

supplied with the maximum ventilation required per hour per head, entirely free from any discomfort from draughts.

3. *The Supply of Fresh Air Warmed or Cooled.*

Up to this point the article has dealt solely with methods for

FIG. 13.



Another arrangement for supplying warmed or cooled air.

cooling and freshening the atmosphere in overheated engine-rooms and apartments as rightly advocated by Dr. Leonard Hill on the score of health; but under certain circumstances it is often necessary to furnish fresh air in volume either artificially cooled or warmed, and such may be effected in the following manner.

The accompanying diagram (Fig. 12) represents an electrically run open fan installation, having an 80 inches diameter air-inlet at the floor level, and of 90 inches maximum external diameter at the fan, surmounting a steel column 8 feet in diameter and 14 feet in height, capable of handling quietly up to 80,000 cubic feet of cooled or warmed air per minute, 60,000 cubic feet of that being fresh air and 20,000 cubic feet of it being inside air in circulation. Within the large cylindrical steel column cooling or heating elements to the extent of 1500 square feet may be arranged to give the temperature desired to the air coming from outside and being propelled into the hall or other large apartment in which the column is placed; while the atmosphere of the said hall or apartment may be circulated at pleasure up through the movable registers "A" in order to keep the whole air of the apartment in movement even at the floor level.

Fig. 13 illustrates a somewhat different arrangement for cooling or warming (preferably for *warming*) fresh air in volume. The drawing represents on a reduced scale a part vertical section and a part elevation of an open fan installation, electrically run. If used for warming purposes the air would be preferably delivered at or towards the floor level, as shown, one of the main features of this arrangement also being that not only would the air be most efficiently treated, but its distribution would be equally good. As seen by the drawing, the apparatus at its lower part is shown made for resting on the floor, but naturally it may also be constructed for fixing at a higher level according to circumstances and the intention. In this case the whole may be connected to a fresh air duct coming down through the roof or from the upper portion of a building, which makes the arrangement somewhat different from that shown by the immediate previous illustration.

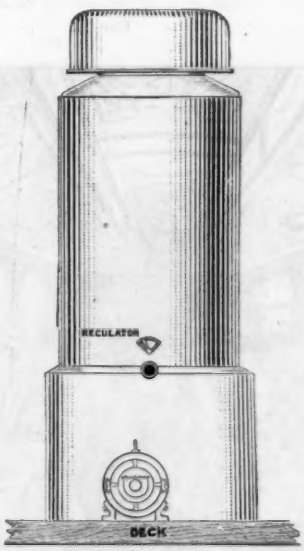
In ventilation, like other things, it is the realities that matter; and although according to theory or rudimental principles it would appear to be equally efficient to force air down or through a properly proportioned and constructed duct or conduit of any given length as it is to draw air down or through the same, in the experiences of the writer (especially under such unnatural conditions as pertain in deep stokeholds of great liners) this does not always appear to be quite the case in actual practice, unless with the addition of special and large delivery or distributing diffusers at the lower ends of the air ducts in order to secure the full value in increased volume of air at a lower velocity for the additional power expended in the first instance.

In connexion with the same principle and example, Fig. 13A represents in elevation what may be called a "rhigothermo" ventilating cased fan installation, electrically run, for effectively delivering under moderate pressure an abundant supply of fresh, cooled, diluted, or warmed air from the upper deck of a modern ocean liner down to the various state-rooms, &c., below. By this means the very highest possible efficiency is obtainable, as will be seen when it is stated that with, say, a difference of temperature of 40° F. between the temperature of the outside air in cold weather and that of the air delivered into the duct, every 1000 cubic feet of air per minute so delivered at a constant 2 inches total water-gauge pressure only requires in motor power the expenditure of a fraction more than half a horse.

In this case, so far as the writer knows, the application as shown is novel, and is quite different in principle and action from the usual method of forcing air at a much higher initial pressure by a fan through small tubes in a cylinder taking much more power, and by which there is a great loss of air in volume before being delivered at the lower pressure. By the newer method illustrated the fan draws or (by another adaptation) forces the air down freely around heated or cooled surfaces, and compresses it only to the ultimate delivery pressure necessary for the main duct. Thus a material increase in air-volume and saving in power is effected, there being no loss in air-volume and power effect between the fan and the inlet to main air-duct going through deck.

Figs. 14 and 14A, again, represent the application of the new method of ventilation to a general shipping office,

FIG. 13A.

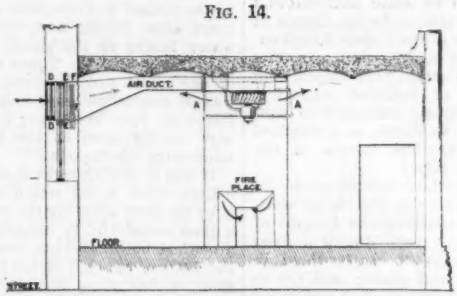


A "rhigothermo" ventilating installation.

for the purpose of freshening up the atmosphere and keeping it pure, sweet, and comfortable, and equable in temperature at all times of the year. By means of this

installation a flow of fresh air in volume of approximately 3000 cubic feet per minute in cold weather and 5000 cubic feet per minute in summer without appreciable cold draughts, or respectively a complete change of the whole cubical air contents of the office to the extent of 16 times an hour in winter and 27 times an hour in summer, are obtainable at an expenditure for electrical current for motor of only about from ⅜ h.p. in winter to ½ h.p. in summer. The fresh air, taken from at least 12 feet above the street level by the noiseless running electrically driven open fan (having a 25 inches diameter air-inlet and running at from 280 minimum to 460 maximum revolutions per minute), is delivered horizontally between the two steel discs either warmed or cold along the ceiling of the office at from 9 to 10 feet from the floor level, and then gradually falls towards the two fireplaces, tending to increase the better draught of the chimneys. From the disc above fan a cotton or other fringe hangs (as shown by dotted lines at A to A), which, being flexible from the lower edge, indicates visibly and effectively the constant movement of the air being handled and assists the imagination of sensitive inmates that a constant change of air is being effected without any felt draughts.

FIG. 14.



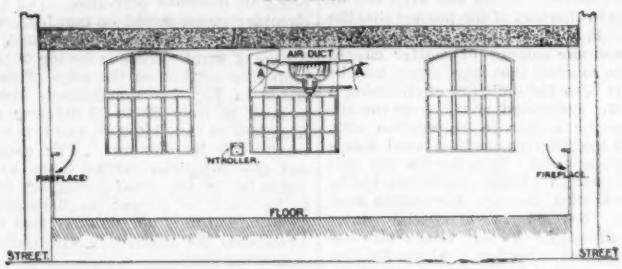
Transverse section of office and longitudinal section through fresh air duct. Cross section (between D and D) through fine brass gauze screens in frames removable from the outside. Cross section (between E and E) through adjustable louvres. End elevation (F and F) of vertical pipe long steam radiator. Hanging fringe (A and A) round disc plates.

Remarks.

Until very lately it was not possible to obtain open fans capable of creating a water-gauge of any consequence in a duct or air-inlet, and of handling air so obtained and delivering it in volume efficiently into open space at a fairly high velocity, but now such open fans may be had capable of effectively performing such work when necessary against a *static* pressure on the delivery side, and that, too, without back-slip.

It may be noted that one great advantage of the plenum methods of ventilation is that, given a pure source from which to obtain the fresh air supply, all local or surrounding smells or contaminations are effectually kept out of the apartments or places treated, while the vitiated air is thoroughly displaced through the proper exits provided. It goes without saying that where the external air source is either impure or not free from suspicion, or is dust-laden or smoke-contaminated, it may require to be screened and cleansed before it is propelled into buildings containing valuable and delicate machinery and where there are workers.

FIG. 14A.



Longitudinal section through office and transverse section through fresh air-duct.
The lettering of the controller is imperfect on the block.

Although, as Dr. Leonard Hill has well said, the open fire and wide chimney ensure ventilation, those only apply to comparatively small rooms when not crowded and in the United Kingdom, which is the only country where open fires are in general use. What he has called a sufficient draught of cool and relatively dry air (conducive to good health) can, in crowded places, and especially in overheated engine-rooms, "tube" railways, stokeholds, workshops, offices, &c., only be effectively and comfortably obtained by methods similar to those described and illustrated.

The science of ventilation, with all its apparent contradictions and inconsistencies, is really a life's study, and a system that may be eminently efficient and satisfactory under certain conditions and circumstances may be unsatisfactory under other conditions. There is no royal road to success in ventilation any more than there is in other branches of technical science; but this much is certain—viz., that good ventilation—as so well set forth by Dr. Leonard Hill—cannot possibly be secured or assured (and especially under what might be called unnatural conditions) without the expenditure of money and some form of mechanical energy, under the skilled guidance of experienced masters in the art.

It may be added that not only does good and healthy ventilation on the lines indicated tend towards increased efficiency, health, and happiness in the workers in crowded and overheated enclosures, but an immense saving per annum may be effected in the wear and tear of running machinery and in lubricants by the reduction of the atmospheric temperature in sultry and often almost "tropical" engine-rooms, &c., to a more natural, normal, and less "vicious" degree; so that all round (as our American cousins might be inclined to say) better or more nearly perfect ventilation is really after all a paying proposition.

When it is considered that in the experience of the author many of these modern underground and underdeck engine-rooms have a uniform or an unvarying over-heated "windless" atmosphere of from 100° F. in winter to 150° in summer, notwithstanding the usual apparatus in use for attempting to secure so-called mechanical ventilation, the pertinence and seriousness of Dr. Leonard Hill's remarks and warnings will be better understood.

As regards "the maintenance of health" so far as the general public and the workers are concerned, verily it may be said to be largely dependent on the "essentials required of any good system of ventilation"—viz., "movement, coolness, proper degree of relative moisture of the air" and "reduction of the mass influence of pathogenic bacteria" in order to prevent as much as possible the making of "the pale, undeveloped, neurotic, and joyless citizen"—and it should be the first duty of the Government to legislate to that end. Certainly we have laws relating to the ventilation of factories for certain industries, mines, and particular unhealthy trades, but Parliament has not nearly gone far enough in this direction, as may be seen from the death records published pertaining to particular trades and districts, which results clearly point to want of adequate light and air space in underground workshops, &c., overcrowding, and lack of fresh air or proper ventilation.

The main object aimed at in the formulation of this article will have been attained should increased interest in the important subject of ventilation have been engendered and fostered by its publi cation.

METHODS OF MEASURING ATMOSPHERIC POLLUTION BY SUSPENDED MATTER.[1]

BY DR. JOHN S. OWENS, F.R.G.S., F.G.S., A.M.I.C.E., M.R.S.I.

IN this paper some of the different methods which may be used to measure the degree of pollution of the air by smoke, dust, and other suspended impurities are considered, and their relative merits discussed.

In 1911, at the International Conference on Smoke Abatement held in London, it was proposed by the author that an attempt should be made to obtain by some uniform and standardised method comparative data as to the degree of pollution of the air at different parts of the United Kingdom. A committee was appointed at the conference to consider what means should be adopted to attain this object, and the author undertook the work of honorary secretary. In connexion with this work it became necessary to consider methods of measurement and to decide on a standard form of apparatus to be adopted. The results of the investigations made appear in this paper.

Before reviewing the possible methods which might be used it will be well to define exactly the objects in view. These were: (*a*) To measure quantitatively the amount of matter deposited from the air at any place during a fixed period; (*b*) to measure the amount of matter held in suspension in the air at any time and place; and (*c*) to find the nature and composition of deposited or suspended matter.

A knowledge of the degree of pollution of the air at different places enables us to make a comparison between one place and another, and also gives some measure of the success attending attempts to purify the air in any particular district.

Having defined the objects in view we may now discuss the various methods and their relative merits in the light of this definition.

Filtration Method.

1. A measured volume of air may be filtered through cotton or asbestos wool and the weight of the deposit ascertained. This method was used by Mr. Russell for the Meteorological Office, and the details of his experiments are given in the monthly weather reports for 1884–85; it has also been used since by different observers. In order to ascertain the weight of deposit on the filter the wool has to be very carefully dried and weighed before and after the air is drawn through, and it is in this part of the process that the greatest difficulties arise. It is by no means easy to get the wool dried completely, and the amount of matter caught from the air by the filter is so small that large errors may be thus introduced. There is also the difficulty of obtaining a filter which removes all the suspended matter from the air. In experiments made by the author in conjunction with Mr. J. C. Clark in 1910 the filtering medium used was a cotton wool plug in a glass tube. In order to dry this thoroughly air was drawn through a tower containing $CaCl_2$, then through H_2SO_4, and then through the cotton wool filter, which was kept warmed in a special water bath. To test the efficiency of the filter, air was drawn through two filters placed in tandem; in case the first was not stopping all the suspended matter, the second filter should show an increase in weight after a considerable volume of air had been drawn through. The air was drawn through the apparatus by means of a reversed gas compressor driven by a small hot-air engine, and between the pump and the filter a gas meter was fixed to measure the volume dealt with. The method worked fairly well, but it was soon found that to obtain reliable results a larger apparatus would be required, one capable of filtering at least 100 cubic feet per hour. In one observation made in London on Dec. 28th, 1910, during a slight fog, 28·1 cubic feet of air were filtered and an increase of weight of only 0·0014 gramme obtained. By this method, although the amount of impurity can be ascertained, it is not easy to find its nature owing to the difficulty in separating it from the filter. It may be said to fulfil condition (*b*) but not (*a*) or (*c*). In fact, no single method can fulfil both conditions (*a*) and (*b*); that is, measure the amount of deposited and suspended impurity. Two separate observations are required, but any method used for either (*a*) or (*b*) should also fulfil conditions (*c*), as it is important to find the nature of the impurity present.

The Method adopted as the Standard.

2. All rain and deposited matter falling on a gauge vessel of known catchment area may be collected, the water evaporated or filtered, and the residue weighed and analysed. An investigation was conducted by THE LANCET[2] during the years 1910 and 1911 into the sootfall of London, this method being used. The experiments were made under the auspices of the Coal Smoke Abatement Society, and all the analytical work was done in THE LANCET Laboratories under the direction of Mr. Vasey. The gauge was designed by the author, and consisted of a vessel of 4 square feet catchment area, having a conical bottom so arranged that all water falling in the gauge vessel was collected in bottles placed underneath. These bottles were removed at intervals of one month and the contents analysed. The gauge vessel was of enamelled iron, square in plan, and supported in a frame on four iron legs; it was surrounded by a cage of wire netting, open at the top to prevent birds from contaminating the deposit.

It was at first thought that the gauge might be fitted with a filter which would retain all the solid matter washed into it by the rain, allowing the water to escape. For this purpose a glass vessel 3 in. in diameter and 6 in. deep, terminating in a conical bottom with a small central opening, was fixed to the bottom of each gauge; this vessel was fitted with a filter of fine glass wool held between two screens formed of nickel gauze with asbestos wool between. It was pointed out, however, by Mr. S. A. Vasey, the director of THE LANCET Laboratories, that this filter frequently showed a loss instead of a gain in weight after receiving a month's rainfall. This, he suggested, was probably due to solubility of the glass wool. The method was therefore abandoned in favour of that ultimately suggested by Mr. Vasey, in which all water and deposit were retained for examination. As modified in this way, it has now been adopted by the Committee for the Investigation of Atmospheric Pollution, and with certain other alterations in the form and details of construction, as indicated below, has been decided on as the standard method for use by authorities which are coöperating with the committee by taking observations in their respective districts. It fulfils conditions (*a*) and (*c*).

The standard form of apparatus decided on consists of a circular gauge vessel of enamelled cast iron, the enamel being an insoluble porcelain. The gauge vessel rests in a circular ring supported on four legs, which also carry a shelf for holding the bottles which collect the water and deposit. A cage of wires surrounds the top of the apparatus to prevent birds from settling on the edge of the gauge. This is illustrated in Fig. 1. Simultaneous observations will be commenced at from 20 to 30 different stations in the United Kingdom on Oct. 1st next, and it is hoped that very valuable results will be obtained. The gauge collects rain water and any impurities carried down by it, and dust or soot, which fall in the vessel during dry weather. No attempt is to be made at present to distinguish between these two deposits, but it is not unlikely that when the work is well established the committee will consider the possibility of separating them.

When removing the bottles at the end of each month the gauge vessel will be washed down carefully into the bottles by using some of the water already collected, so as to remove any adherent matter. The results obtained during the preliminary year's experiment above referred to, made with gauges of this type, were very promising. The monthly deposits at four different stations were compared; three of these stations were in London, the fourth in my garden at Cheam, Surrey, about 12 miles out on the S.W. side. The total amounts of deposit for the year, according to the estimations made in THE LANCET Laboratories, were as follows:—

Station.		Deposits in tons per square mile.
Buckingham Gate, S.W.	London	500
Horseferry-road, S.W.		420
Old-street, E.C.		650
Cheam, near Sutton, Surrey		195

[1] A paper read at the meeting of the British Association for the Advancement of Science.

[2] See THE LANCET, Jan. 6th, 1912.

The curves (Fig. 2) show the sootfall and rainfall for each month at the three London stations (averaged) and at Cheam, Surrey. It will be seen that the deposit on the London area is very much greater than at Cheam. Also its composition is different, as the deposit in London contained about six times as much soot, sulphate, and ammonia. There is also an indication of a relation between the amount of rain and of solid matter deposited, but the period is not long enough to enable us to state what the relation is. It is hoped that when the results from different centres and for longer periods are available the exact nature of this relation will be brought out.

Other Methods.

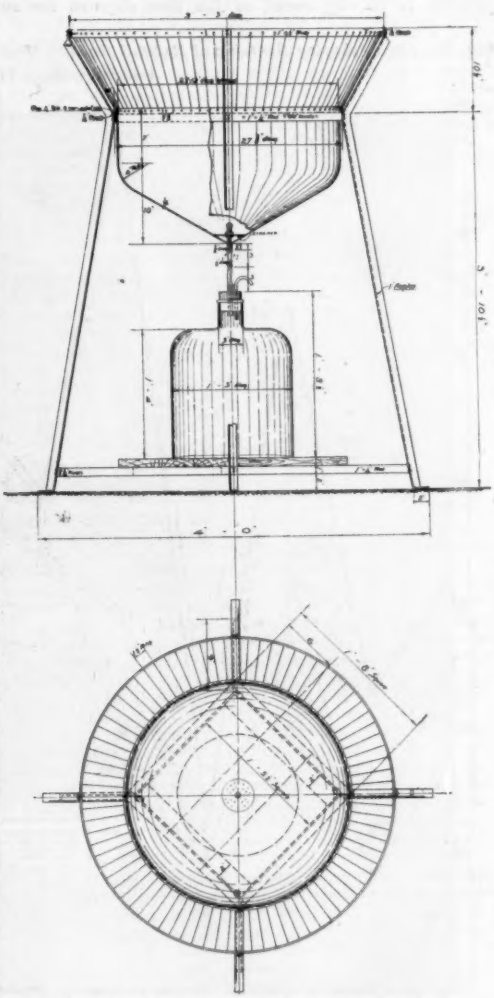
3. *Aitken's dust counter.*—This is an ingenious instrument devised by Mr. John Aitken and described fully in the Transactions of the Royal Society of Edinburgh, Vols. XXX. to XXXVI. It is intended for counting the number of dust particles in the air, but no attempt is made to ascertain their composition. It is questionable whether the number of particles is a fair measure of the amount of impurity present, since no account is taken of their size. Hence it would appear that a small number of large dust particles may, according to this instrument, indicate a purer air than if a large number of smaller particles were present, whereas the amount of impurity may be greater in the former than in the latter case. According to Aitken there are about 300 to 3000 dust particles in a cubic centimetre of country air from Argyleshire, whereas that of London contains 48,000 to 150,000 in the same volume of air. The method adopted is to cause the moisture in a small measured volume of air to be precipitated as rain on the glass slide of a small microscope, when the number of drops which fall may be counted. It is assumed that each drop has for its nucleus a dust particle. The method has the drawbacks above indicated, and cannot be said, from our present point of view, to fulfil any of the conditions laid down.

4. Glass plates may be exposed to the air for a known length of time, then washed in water and their opacity measured. This method was devised by Professor Cohen, of Leeds, and used there by him. It is primarily intended for measuring the amount of tarry soot which falls at a given place; as tar, or some sticky matter, is necessary to enable the deposit to adhere to the plate when washed. Obviously the results cannot be based on the opacity of the unwashed plate, since it must be always exposed to rain, and will therefore be more or less washed whether it is intended to be or not. The indication given provides a rough basis of comparison between the deposits at different places; also since the chief distinguishing feature between smoke or soot from a domestic chimney and that from boiler and other industrial furnaces is the percentage of tar present, the method enables us to say roughly whether the deposit is due chiefly to domestic or factory smoke. There are, however, certain objections which make it unsuitable as a standard method. Briefly, none of the conditions laid down are fulfilled; the opacity of the plate must depend on the stickiness of the deposit, not on its amount; also it appears probable that during the period when the greatest amount of deposit reaches the ground—that is, during rain—the plate would be unable to retain it owing to its surface being wet.

5. A jet of air of standard size and velocity may be caused to strike a glass plate placed at a fixed distance from the nozzle, and the opacity of the plate measured after a definite time. The plate might be coated with some sticky substance, so that all particles striking it adhere. This method might be used in one of two ways: The air jet may be caused to play on the plate for a fixed time and the opacity measured by comparison with a specially calibrated scale, or the jet may be made to play on the plate for such a time as will cause a fixed opacity, and the time required compared with a calibrated time scale. So far as I am aware the method has not been tried, and is now suggested for discussion. Some such means of obtaining the amount of suspended matter, as distinct from that deposited, is required; and it should be one which permits of making a complete measurement in a short time, such as an hour, since in cities where fogs are prevalent it is usual to find great variations in their density occurring during short periods. Practically speaking, the shorter the time required for making an observation the more suitable the method would be; it is probable, however, that the one described above would not give sufficient accuracy to be suitable.

6. A measured volume of air may be drawn through filter paper and the degree of discolouration produced on the paper compared with a calibrated scale. Or the air may be drawn through the paper until a predetermined degree of discolouration has been produced. The method has been tried in Glasgow with considerable success, and experiments are now being carried out with a view to its adoption as a standard

FIG. 1.



Standard deposit gauge as adopted by the Committee for the Measurement of Atmospheric Pollution.

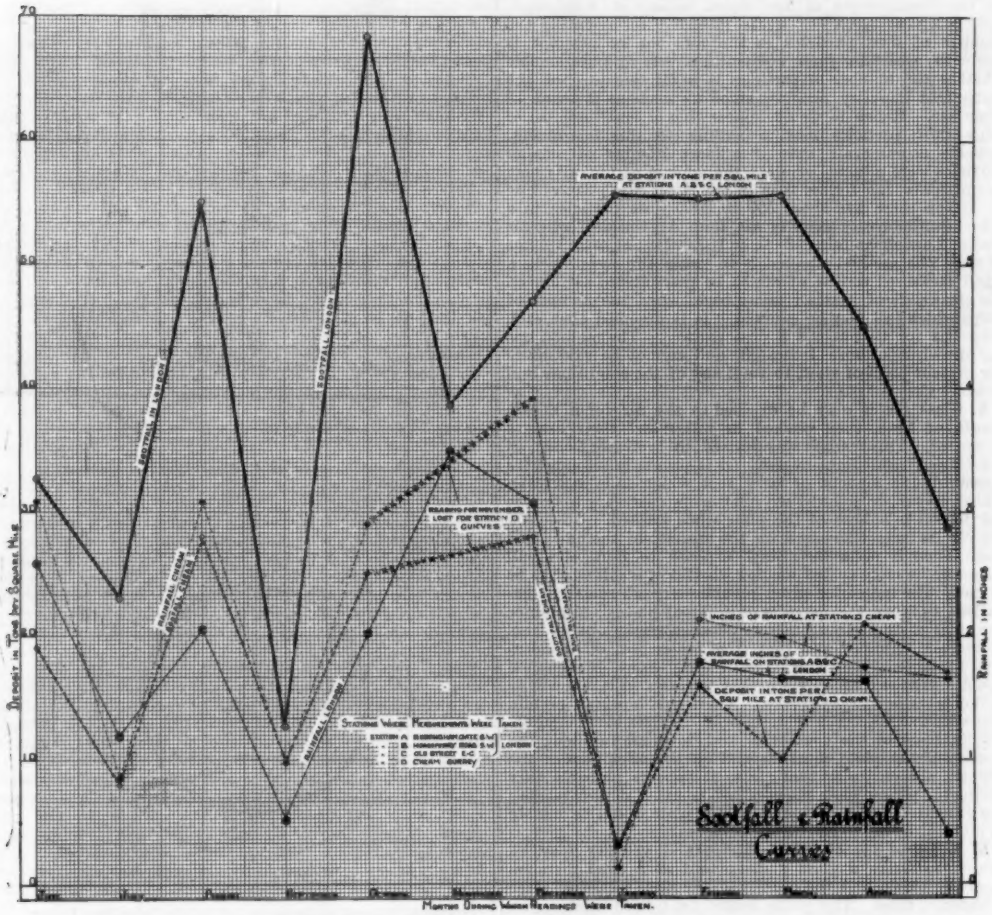
by the Committee for the Investigation of Atmospheric Pollution. There are, however, certain difficulties and drawbacks which have yet to be overcome. In the experiments made the air was drawn through a sort of drum over the mouth of which discs of filter paper could be fixed. The air was measured by passing through a meter, the pump being operated by a small electromotor. After some time the paper becomes quite black and its pores somewhat clogged up, so that it is difficult to maintain a current of uniform velocity through it. Also the colour of the deposit depends on other factors besides its amount; in fact, it is only when the nature of the suspended matter is the same that a comparison may be made between different places by this means. It is, however, fairly suitable for comparing the degree of pollution

of the air at the same place at different times. The attempt is now being made to obtain a suitable filter paper which may be dissolved in some liquid, and by this means separated from the deposit; but this is difficult, since it must be something which will not interfere with the subsequent analysis of the deposit. The amount of deposit on a filter paper which is required to cause a definite discolouration is so small as to be hardly weighable. With some modification such as above indicated, and provision for obtaining a sufficient quantity of deposit to weigh with accuracy, this method promises to be very useful, as the time required for an observation is short, and the whole apparatus may be made in a compact form.

7. An optical method might be used by which the opacity of a column of air of a given length to a standard light is measured. This might be arranged to give quantitative results by preparing a scale of opacity from measurements taken on air with known amounts of suspended matter present, but the results would probably not be of great accuracy, unless perhaps in the case of dense smoke fogs. The presence of water vapour would have to be guarded against in some way, but how it is not easy to see. It might perhaps be done by keeping the column of air warmed so as to destroy the part of the fog due to water, and agitated to prevent settling of the other particles while making an observation. It is not a very promising method, the chief advantage being that, if practicable, it would permit an observation to be taken almost instantaneously, and would require no weighing to give the degree of pollution; it would not, however, fulfil condition (*c*), which is most important. Also, the indication given would depend rather on the power of the suspended matter to obstruct light than on the quantity present; in other words, the size of the suspended particles would falsify the result, since a small number of large particles might contain more impurity than a large number of smaller ones, while obstructing less light. That this is no fanciful objection may be seen by anyone who notes the variation in the size of smuts which fall in cities on different days. It seems probable that under certain atmospheric conditions soot, and probably other kinds of suspended matter, tend to collect in large particles, whereas on other days there is no such tendency. It would seem from this consideration that no method of measuring suspended matter which depends on the opacity of the air, or of glass plates exposed to catch the deposit, or on the degree of discolouration of filter paper through which air is drawn, can be of great accuracy; and the indication is that whatever method is used it must aim at the weighing and analysis of the matter suspended in a known volume of air.

8. The rain might be caught and its opacity, after thorough shaking, compared with a standard scale made by

FIG. 2.—*Curves showing Sootfall and Rainfall for each Month at three London Stations, and at Cheam, Surrey, according to Analyses made in* THE LANCET *Laboratory.*



adding definite quantities of soot to distilled water. A method somewhat similar to this was used by Dr. Fritzsch for measuring smoke issuing from chimneys. He filtered a measured volume of smoke through filters of cellulose, which was subsequently dissolved in ether and the opacity compared with other solutions containing weighed quantities of soot. For our present purpose the method is open to objection, as it only gives the quantity of impurity carried down, and that with doubtful accuracy, while it does not fulfil condition (*c*). The apparatus required would also be almost similar to that described under method 2, but the results would not be so valuable.

9. Boxes having a collecting surface of known area may be exposed for a definite time and their contents collected and analysed. This system was devised by Mr. Peter Fyfe, chief sanitary officer, Glasgow, and was used with some success in that city. It is a crude form of method 2. The boxes to be effective must be watertight, otherwise during dry, windy weather some of the collected material would be blown away. In this form they are simply rain and deposit gauges aiming at the same results as method 2, except that in the present case it is necessary to remove the whole gauge-box when it is desired to measure the amount of deposit, whereas in the other the rain and deposit are allowed to fall into bottles placed under the gauge vessel, and these are removed for analysis.

Remarks.

In conclusion, there are one or two points which it will be well to keep in mind when considering the subject of this paper. The utmost care is now lavished by our public health authorities in preventing pollution of our drinking water and of food; but while we consume these to only a moderate extent as compared with the air which we breathe, very little attention is given to purifying or preventing pollution of the latter. Curiously enough also the whole science of ventilation, if it may be called a science, is based upon an utter fallacy. We now know, without any question of doubt, that the "terrible" gas—carbon dioxide—which is still used as an indicator of good or bad ventilation is quite harmless unless when present in a proportion approaching that in expired air. It is unnecessary to dwell on this point, since it is beyond question. We also know that all air-borne diseases are transmitted, not by means of a poisonous gas, but by solid particles carried in suspension in the air. Yet still we find ventilation experts gravely measuring the proportion of CO_2 in the air of a building, and pronouncing from this on the suitability or otherwise of the air for breathing. Surely it is time for us to alter all this, and base our statements as to the purity of the air upon the absence of dust, which is the real source of danger.

One other point may be mentioned. When a person is exposed to infection—for example, breathes an air laden with tubercle bacilli—whether he contracts the disease or not depends on two factors: (*a*) the dose, and perhaps the virulence of the disease carrying microbe, which he receives; and (*b*) his own resisting power to infection.

It is important to remember these, as too much stress is often laid on one and not enough on the other. There are now several systems of ventilation by which an attempt is made to filter the air before it is allowed to enter a building; but no attempt is made to measure what the purifying effect of such methods is. The designer appears to be satisfied if his screens or filters collect a good deposit of dirt. As it is impossible by ordinary means to distinguish between dust which is more or less harmless and that which contains disease germs, surely it is not going too far to say that careful measurements of the amount of suspended impurity contained in the air would be a far better indication of its suitability for breathing than our present methods. Such measurements should include a bacteriological test of the nature of the suspended matter as well as a physical and chemical one.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—The opening of the winter session will take place on Wednesday, Oct. 1st, at 3.30 P.M., when the prizes and awards for 1912–13 will be presented, and an address delivered by Sir John Prescott Hewett, K.C.S.I. The annual dinner of past and present students will be held on Thursday, Oct. 2nd, at the Grand Hall, Princes' Restaurant, at 7 P.M., Dr. Horace Sworder in the chair.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN the 96 English and Welsh towns, with populations exceeding 50,000 persons at the last Census and whose aggregate population at the middle of this year is estimated at 17,852,766 persons, 8755 births and 4980 deaths were registered during the week ended Saturday, Sept. 13th. The annual rate of mortality in these towns, which had been 13·2, 13·5, and 13·8 per 1000 in the three preceding weeks, further rose to 14·5 per 1000 in the week under notice. During the first eleven weeks of the current quarter the mean annual death-rate in these towns averaged 12·4, against 11·5 per 1000 in London during the same period. Among the several towns the death-rates last week ranged from 5·6 in York, 6·0 in Swindon, 6·3 in Darlington, 6·9 in Ealing and in Bournemouth, and 7·0 in Willesden, to 21·7 in Middlesbrough, 22·2 in Dudley and in Sunderland, 22·3 in Liverpool, 23·1 in St. Helens, and 23·5 in Rhondda.

The 4980 deaths from all causes were 247 in excess of the number in the previous week, and included 1242 which were referred to the principal epidemic diseases, against numbers steadily increasing from 281 to 1099 in the ten preceding weeks. Of these 1242 deaths, 1104 resulted from infantile diarrhœal diseases, 38 from whooping-cough, 36 from diphtheria, 28 from scarlet fever, 26 from measles, and 10 from enteric fever, but not one from small-pox. The mean annual death-rate from these diseases last week rose to 3·6, against 2·9 and 3·2 per 1000 in the two preceding weeks. The deaths of infants (under 2 years of age) attributed to diarrhœa and enteritis, which had steadily risen from 149 to 960 in the eight preceding weeks, further rose to 1104 last week, and included 229 in London, 78 in Birmingham, 66 in Liverpool, 45 in Manchester, 38 in Hull, 32 in Sheffield, 31 in West Ham, 30 in Rhondda, 27 in Leeds, and 23 in Sunderland. The deaths referred to whooping-cough, which had been 36, 50, and 31 in the three preceding weeks, rose to 38 last week; of this number 7 were registered in London, 6 in Liverpool, 4 in Newcastle-on-Tyne, 3 in Birmingham, and 3 in Manchester. The fatal cases of diphtheria, which had been 37, 36, and 45 in the three preceding weeks, declined to 36 last week; 6 deaths occurred in London, 4 in Birmingham, 3 in Manchester, and 2 each in Southampton, Stoke-on-Trent, Rotherham, Middlesbrough, and Cardiff. The deaths attributed to scarlet fever, which had been 31, 14, and 17 in the three preceding weeks, rose to 28 last week, and included 4 in Sheffield, 3 in London, 3 in Birmingham, 3 in Sunderland, and 2 each in Plymouth, Nottingham, and Manchester. The deaths referred to measles, which had steadily declined from 77 to 33 in the seven preceding weeks, further fell to 26 last week; 6 deaths were registered in Norwich, 5 in Stoke-on-Trent, 3 in London, 2 in Liverpool, and 2 in Manchester. The fatal cases of enteric fever numbered 10, and were equal to the average in the earlier weeks of the quarter.

The number of scarlet fever patients under treatment in the Metropolitan Asylums and the London Fever Hospitals, which had been 2070, 2115, and 2112 at the end of the three preceding weeks, had risen to 2211 on Saturday last; 346 new cases were admitted during the week, against 239, 331, and 298 in the three preceding weeks. These hospitals also contained on Saturday last 810 cases of diphtheria, 214 of whooping-cough, 118 of measles, and 49 of enteric fever, but not one of small-pox. The 1183 deaths from all causes in London were 98 in excess of the number in the previous week, and were equal to an annual death-rate of 13·7 per 1000. The deaths referred to diseases of the respiratory system, which had been 128, 124, and 132 in the three preceding weeks, were again 132 last week, and were 29 above the number in the corresponding week of last year.

Of the 4980 deaths from all causes in the 96 towns, 138 resulted from various forms of violence and 297 were the subject of coroners' inquests. The causes of 28, or 0·6 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest. All the causes of death were duly certified in Manchester, Sheffield, Leeds, Bristol, West Ham, Bradford, Hull, Newcastle-on-Tyne, and in 73 other smaller towns. Of the 28

uncertified causes of death, 9 were registered in Birmingham, 3 in Liverpool, 2 in Portsmouth, 2 in St. Helens, and 2 in Barrow-in-Furness.

HEALTH OF IRISH TOWNS.

In the 27 town districts of Ireland, with an aggregate population estimated at 1,199,180 persons at the middle of this year, 618 births and 485 deaths were registered during the week ended Saturday, Sept. 13th. The annual rate of mortality in these towns, which had been 18·7, 20·7, and 19·9 per 1000 in the three preceding weeks, rose to 21·1 per 1000 in the week under notice. During the first 11 weeks of the current quarter the mean annual death-rate in these Irish towns averaged 17·7 per 1000; in the 96 large English towns the corresponding rate did not exceed 12·4, while in the 16 Scotch towns it was equal to 14·3 per 1000. The annual death-rate last week was equal to 23·2 in Dublin (against 13·7 in London and 18·0 in Glasgow), 20·4 in Belfast, 26·5 in Cork, 19·1 in Londonderry, 27·1 in Limerick, and 5·7 in Waterford, while in the remaining 21 smaller towns the mean death-rate did not exceed 17·8 per 1000.

The 485 deaths from all causes were 27 in excess of the number in the previous week, and included 132 which were referred to the principal epidemic diseases, against numbers rising from 27 to 111 in the seven preceding weeks. Of these 132 deaths, 111 resulted from infantile diarrhœal diseases, 6 from whooping-cough, 5 from enteric fever, 4 from scarlet fever, 4 from diphtheria, and 2 from measles, but not one from small-pox. The mean annual death-rate from these diseases last week was equal to 5·7, against 3·6 per 1000 in the 96 large English towns. The deaths of infants (under 2 years of age) attributed to diarrhœa and enteritis, which had been 71, 97, and 92 in the three preceding weeks, rose to 111 last week; of this number 41 were recorded in Belfast, 37 in Dublin, 7 in Cork, 5 in Londonderry, 3 in Ballymena, and 3 in Queenstown. The deaths referred to whooping-cough, which had been 4, 2, and 6 in the three preceding weeks, were again 6 last week, and comprised 3 in Galway, 2 in Dublin, and 1 in Larne. The 5 fatal cases of enteric fever were all recorded in Dublin. The 4 deaths attributed to scarlet fever, of which 3 occurred in Belfast, were slightly in excess of the average in the earlier weeks of the quarter. Of the 4 deaths referred to diphtheria, 2 were recorded in Belfast, 1 in Dublin, and 1 in Kilkenny; and the deaths from measles in Dublin and Londonderry respectively. In addition to the above deaths, a fatal case of typhus was registered in Belfast.

The deaths referred to diseases of the respiratory system, which had been 51, 43, and 42 in the three preceding weeks, were 41 in the week under notice. Of the 485 deaths from all causes, 144, or 30 per cent., occurred in public institutions, and 8 resulted from different forms of violence. The causes of 12, or 2·5 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest; in the 96 large English towns the proportion of uncertified causes of death did not exceed 0·6 per cent.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

IN accordance with the provisions of Order in Council of April 1st, 1881, Staff-Surgeon Edward Postle Gwyn Causton has been allowed to withdraw from His Majesty's Naval Service with a gratuity (dated Sept. 6th, 1913).

The following appointments have been notified:—Fleet-Surgeons: H. Hunt to the *Superb;* J. Shand to the *Impregnable;* C. M. Beadnell to the *Shannon;* G. G. Borrett to the *Achilles;* E. T. P. Games to the *Dryad*, for Navigation School; C. J. Mansfield, T. C. Meikle, H. B. Hall, G. R. MacMahon, P. H. M. Star, R. A. Ross, and R. H. Mornement to the *President*, additional, for Senior Medical Officers' three months' course; J. E. H. Phillips to the *President*, additional, for London Recruiting Headquarters, temporary. Staff-Surgeons: C. A. G. Phipps to the *Pyramus;* J. S. Dudding to the *Victory*, additional, for Haslar Hospital, and for instruction of Acting Surgeons; R. L. Jones to the *Pathfinder*, on commissioning; R. St. G. S. Bond, P. T. Sutcliffe, and E. T. Burton to the *President*, additional, for Senior Medical Officers' three months' course; G. Taylor to the *Formidable;* G. S. Davidge to the *Naiad;* W. P. Dyer to the *Vengeance;* P. M. Rivaz to the *Bellerophon;* W. T. Haydon to Devonport Yard; J. Stoddart to the *Doris*, and for group of ships of Third Fleet; T. B. Shaw to the *Falmouth;* R. R. Horley to the *Vernon*, temporary; E. S. Wilkinson to the *King Edward VII.;* W. C. B. Smith to Royal Marine Division, Chatham; A. B. Marsh to the *Collingwood;* E. D. Rutherford to Haslar Hospital; D. G. Addison-Scott to the *President*, additional, for R. F. A. Maine; G. C. C. Ross to the *Excellent*, temporary; A. R. Davidson to the Royal Naval Hospital, Portland, and for Portland Depôt; H. R. Gardner to the *President*, additional, for Deptford Victualling Yard, temporary; and J. Macdonald to the *President*, additional, for Yarmouth Hospital, temporary. Surgeons: A. H. Joy to Royal Marine Division, Plymouth; C. G. Sprague to Devonport Yard; G. T. Verry and C. H. Symons, both to Royal Naval Hospital, Cape of Good Hope; and E. Moxon-Browne to the *Indefatigable.*

ARMY MEDICAL SERVICE.

Colonel Henry H. Johnston, C.B., is placed on retired pay (dated Sept. 13th, 1913).

Lieutenant-Colonel James Maher, from the Royal Army Medical Corps, to be Colonel, vice H. H. Johnston, C.B. (dated Sept. 13th, 1913).

Colonel Edward Butt, on completion of four years' service in his rank, is placed on the half-pay list (dated Sept. 15th, 1913).

Lieutenant-Colonel George D. Hunter, D.S.O., from the Royal Army Medical Corps, to be Colonel, vice E. Butt (dated Sept. 15th, 1913).

ROYAL ARMY MEDICAL CORPS.

Major George B. Stanistreet to be Lieutenant-Colonel, vice J. Maher (dated Sept. 13th, 1913).

Major William E. Hardy to be Lieutenant-Colonel vic e G. B. Stanistreet, supernumerary to establishment (dated Sept. 13th, 1913).

Major James E. Brogden to be Lieutenant-Colonel, vice G. D. Hunter, D.S.O. (dated Sept. 15th, 1913).

Lieutenant John H. C. Grene is seconded for service under the Colonial Office (dated August 23rd, 1913).

Colonel F. H. Treherne has been selected for appointment as Assistant Director of Medical Services to the Meerut Division of the Northern Army in India, in succession to Colonel E. Butt, whose tenure of the appointment has expired.

Lieutenant-Colonel H. J. Pocock has been granted an extension of Indian tour of service for one year. Brevet-Lieutenant-Colonel T. W. Gibbard has been selected for advancement to the rank of Lieutenant-Colonel. Lieutenant-Colonel R. Caldwell has taken up duty in the Southern Command. Lieutenant-Colonel G. S. McLoughlin, D.S.O., has been appointed Commandant to the Royal Army Medical Corps Camp of Instruction at Tidworth Park, Salisbury Plain. Lieutenant-Colonel O. R. A. Julian, C.M.G., has been selected to hold charge of the Royal Hospital at Chelsea.

Brevet-Major A. B. Smallman has taken up duty as Assistant Instructor at the School of Army Sanitation.

Major G. Mansfield has been appointed to hold charge of the Military Hospital at Jersey, in succession to Lieutenant-Colonel E. Davis. Major P. J. Probyn, D.S.O., has taken up duty at York. Major G. Baillie has been appointed for duty at the Military Hospital, Great Yarmouth *pro tem.* Major F. J. Whelan has been appointed Deputy Assistant Director of Medical Services to the Poona Division, in succession to Lieutenant-Colonel O. L. Robinson, transferred to the Home Establishment. Major H. J. M. Buist, D.S.O., in charge of the Military Hospital at Bloemfontein, has been selected for advancement to the rank of Lieutenant-Colonel, vice Lieutenant-Colonel O. L. Robinson, seconded. Major F. A. Symons has been transferred from the Royal Army Medical Corps Camp of Instruction at Tidworth Park, Salisbury Plain, to Gosport. Major G. St. Clair Thom has been detailed for duty on board the transport ss. *Rewa* leaving Bombay for Southampton on Oct. 10th with tour-expired soldiers. Major M. H. Babington has taken up duty at Scutari. Major T. E. Fielding has been transferred from the Military Hospital at Devonport to Wellsworthy. Major B. B. Burke has been

appointed to the Eastern Command for a tour of duty. Major H. W. K. Read has arrived home on leave of absence from India. By an exchange on the roster of foreign service Major R. McK. Skinner will embark for service abroad during the coming trooping season instead of Major C. B. Lawson.

Captain A. G. Cummins has arrived home on leave of absence from Egypt. Captain G. Petit has been transferred from Meerut to Delhi. Captain D. F. Mackenzie has been granted an extension of Indian tour of service for one year. Captain E. M. Middleton has taken over duty at Kuldana, Murree Hills District, on transfer from the Military Hospital at Multan Cantonment. Captain J. W. S. Seccombe has been appointed to Tidworth Park for temporary duty. Captain R. J. Cahill has been appointed to hold medical charge at Athlone Camp. Captain H. H. Leeson has arrived home on leave of absence from the Military Hospital at Alexandria. Captain J. Mackenzie has been placed under orders for a tour of service in India. Captain F. C. Lambert has been transferred from Brownslade Camp to the Military Hospital at Pembroke Dock. Captain F. M. M. Ommanney has taken up duty in the Belfast District. Captain R. C. Hallowes has been appointed to hold medical charge at Ballykinler Camp. Captain W. G. Wright has arrived home on leave of absence from the Military Hospital at Gibraltar. Captain R. C. Wilmot has taken up duty at Hythe. Captain A. S. Cane has taken up duty as Specialist in Venereal Diseases and Dermatology to the Poona Division. Captain G. A. Kempthorne has been transferred from the Military Hospital at Tregantle to Tidworth Park, Salisbury Plain. Captain E. C. Whitehead has been appointed to the Station Hospital at Dinapore Cantonment. An exchange has been approved between Captain D. Coutts, attached to the Military Hospital at Bareilly Cantonment, and Captain A. W. Howlett, I.M.S. Captain G. H. Rees has been appointed to hold medical charge at Mosney Camp. Captain A. Shepherd has arrived home on leave of absence from the Military Hospital at Agra Cantonment. Captain J. H. Duguid has been appointed Specialist in Otology. Captain H. B. Connell has been appointed for a tour of duty to the Western Command. By an exchange on the roster for foreign service Captain M. Keane will embark for service abroad during the coming trooping season instead of Captain R. L. V. Foster. Captain J. T. Simson has arrived home on leave of absence from Cairo. Captain H. St. M. Carter has been detailed for a course of instruction at Tidworth Park, Salisbury Plain. Captain C. T. V. Benson has been transferred from Bangalore Cantonment to Calicut. Captain C. R. Millar has arrived home for duty on the home establishment from the Sierra Leone Protectorate. Captain G. G. Tabuteau has been appointed Specialist in Operative Surgery to the Cork District. Captain G. S. Parkinson has arrived home for duty from Pretoria. Captain H. E. Priestley has taken over medical charge of Woodham Camp. Captain O. C. P. Cooke has been appointed to hold charge of the Military Hospital at Deolali Cantonment. Captain F. W. W. Dawson has been appointed Specialist in the Prevention of Disease, and placed in charge of the Bacteriological Research Laboratory at Brigade Headquarters, Ambala Cantonment. Captain P. Dwyer has taken up duty as Company Officer at Dublin.

Lieutenant J. M. Elliott has been placed under orders for transfer from the Military Hospital at Cosham to Hilsea. Lieutenant W. McNaughtan has taken up duty at Tidworth Park, Salisbury Plain. Lieutenant R. T. Vivian has been appointed to the Military Hospital at the Curragh Camp. Lieutenant J. B. A. Wigmore has been detailed for a tour of duty in the Aldershot Command. Lieutenant W. W. Pratt has joined the Queen Alexandra Military Hospital for duty. Lieutenant D. T. M. Large has been transferred from the Military Hospital at Glasgow to Stobs for temporary duty. Lieutenant H. Beddingfield has been appointed for a tour of duty in the Eastern Command. Lieutenant H. N. Sealy has joined the Irish Command.

INDIAN MEDICAL SERVICE.

Surgeon-General H. W. Stevenson, C.S.I., has been granted leave of absence home from India.

Colonel C. F. Willis, C.B., has notified his intention of retiring from the service and will be succeeded at Secunderabad by Surgeon-General T. M. Corker. Colonel J. Smyth has arrived home on leave of absence from India.

Lieutenant-Colonel W. R. Edwards has been selected for appointment as an Agency Surgeon of the First Class, in succession to Lieutenant-Colonel J. L. Woolbert.

Major H. H. Mackenzie has been appointed to officiate as Professor of Pathology at the Government Medical College, Lahore, in succession to Major J. F. Forster granted leave of absence home from India for two years. The services of Major H. R. Nutt have been placed permanently at the disposal of the Government of the United Provinces of Agra and Oudh.

Captain J. M. Holmes has been appointed Specialist in the Prevention of Disease and placed in charge of the Bacteriological Research Laboratory at Brigade Headquarters, Sialkot Cantonment. The services of Captain T. G. F. Patterson have been placed at the disposal of the Government of Bombay for employment in the Civil Medical Department. Captain W. A. Mearns has joined the Bombay Presidency. Captain M. F. Reaney has arrived home on leave of absence from India. Captain F. W. Cragg has been appointed to officiate as Assistant Director at the Central Research Institute of India, Kasauli, during the absence on special deputation of Captain J. Cunningham. Captain H. Crossle has been appointed an Agency Surgeon of the Second Class. Captain E. W. O'G. Kirwan has been appointed a Specialist in Radiography and Electrical Science. The services of Captain H. M. Brown have been placed temporarily at the disposal of the Government of Bihar and Orissa for employment in the Sanitary Department.

SPECIAL RESERVE OF OFFICERS.

Royal Army Medical Corps.

Ernest Franz Waldemar Grellier to be Lieutenant (on probation) (dated August 21st, 1913).

TERRITORIAL FORCE.

Royal Army Medical Corps.

2nd West Lancashire Field Ambulance, Royal Army Medical Corps: Lieutenant George C. E. Simpson to be Captain (dated April 4th, 1913).

Attached to Units other than Medical Units.—Lieutenant Charles Corfield to be Captain (dated May 22nd, 1913).

DEATHS IN THE SERVICES.

Major George Johnstone Buchanan, R.A.M.C., on August 22nd, aged 48, the result of an accident. He entered the service in 1892, was promoted to captain in 1895, and to major in 1904. For some time he held the appointment of staff-surgeon at Cawnpore, and afterwards saw active service in the Tirah campaign on the North-West Frontier (medal and clasp, 1897–98). Later he went to Dum-Dum and was subsequently present at the Delhi Durbar. His knowledge of the Indian dialects was remarkable, and he had occupied the post of examiner in Urdu to the Government of India.

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

Among the original communications in the September issue of the *Journal of the Royal Army Medical Corps* is a preliminary report on the Treatment of Human Trypanosomiasis and Yaws with Metallic Antimony (Plimmer), by Captain H. S. Rankin, the substance of which has recently been published in the Proceedings of the Royal Society. In the issue of the journal for October, 1912,[1] Major S. L. Cummins and Major C. C. Cumming published a preliminary note on immunisation against bacillus paratyphosus A, and they now return to the subject, summarising the results of their work as follows: "1. Bacillus paratyphosus A vaccine, given in two doses of 500 and 1000 millions respectively, at an interval of 12 days, gave rise to no reaction of importance. 2. A mixed emulsion of B. paratyphosus A and B. typhosus in similar doses gave rise to a reaction not appreciably more severe than that following antityphoid inoculation. In saying this we make the reservation that individuals may differ in their reaction, and that a final conclusion cannot be reached without a more extended trial. 3. The serum of persons inoculated with vaccine of B. paratyphosus A was found to develop very little specific opsonin. 4. Inoculations with B. paratyphosus A led in human beings to a considerable production of agglutinin in the serum, thus differing from similar inoculations in rabbits." Major W. E. Hudleston contributes an analysis of our present position

[1] THE LANCET, vol. ii., 1912, p. 1103.

with regard to the prevention and cure of malarial infections, pointing out that malarial fevers are now responsible for the greatest amount of inefficiency both in our British and Native armies in India. Colonel R. H. Firth adds to the interesting musings and speculations which he contributes from time to time a Study in Comparative Psychology, analysing the mental processes, feelings, and actions in man and animals, and building up on the data deduced a picture of human mental evolution. He takes the view that man is a part of Nature, "an organism adapted to his environment just like any other organism, but having the supreme advantage of an unlimited adaptability, by virtue of his mental development ..... this power of adaptation is wholly bound up with a knowledge of Nature's methods; in other words, the present well-being and the future progress of the human race are dependent on an obedience to Nature's laws, and an attitude of mind which recognises rectitude and fitness only where the greatest good results for the greatest number. It is towards the perfection and universal application of this ethical idea that the mind of man is evolving; and of the manner in which the end will be attained, we may say there are diversities of gifts, but the same spirit."

THE MILITARY SURGEON.

In the number for July, Captain L. C. Duncan, Medical Corps, United States Army, tells us what happened to the 9600 men wounded at the battle of Fredericksburg on Dec. 13th, 1862. Since the battle of Antietam in September the medical department of this army had been wisely reorganised by the Medical Director, Letterman, and it had now its own transport under its own officers. By the help of its 1000 ambulances, all the wounded were collected and under canvas in four days in the divisional hospitals. Thence they were evacuated to Washington, some 45 miles away, by rail and river. The first wounded reached Washington on the 14th, but they were wounded whose wounds the surgeons could not find. Really, they were stragglers or cowards. Letterman said these were the men who raised the cry of want of attention on the part of the surgeons whom they sedulously avoided lest by them they be sent back to their duty. Any complaint of neglect by the surgeons made immediately after a battle is probably factitious and intended to prevent examination of the conduct of those who make it; real neglect, if it ever occurred, would not come out till much later. The journey by train was made on flat trucks, bedded for choice with pine or cedar boughs, which do not, like hay and straw, become infested with vermin. Washington had now plenty of hospital beds, and sent none of the wounded away till they began to clamour for them down in the country. Then the wounded were sent away from Washington, all of them, not only those whose injuries would prevent their again doing duty. Consequently men lightly wounded got away from discipline and were lost to the army. After this unsuccessful battle all the generals were relieved, but Lettermann's conspicuous success kept him in his place. There is an account of measures to be taken on board in a battle at sea by Dr. N. I. Awgustowsky, of the Russian Imperial Navy, who quotes with approval Fleet-Surgeon C. M. Beadnell's view of the excellent moral effect of well-prepared first-aid measures. In the last war the Russian medical officers were overwhelmed with the number of wounded that came to them as soon as the battle opened, the wounds were so many, so terrible, so extensive. "What dressing should we apply when the pelvis is bared with the buttocks torn off?" There is little bleeding; not much can be done at the time beyond perhaps the removal of foreign bodies. In the dressing stations lanterns are needed, and large first dressings—opium and tincture of iodine are not mentioned, perhaps because so well known.

COMMUTATION OF PENSIONS.

It is announced that the rates for commuting pensions of officers in the army and navy will for the future be increased about 5 per cent., and the fees to be charged are to be considerably reduced. The new regulations will not be retrospective.

Mr. William F. Fiske has been asked by the Tropical Diseases Committee of the Royal Society to investigate the life-history of the tsetse flies in Uganda concerned in the propagation of trypanosome diseases.

MEDICAL PRACTICE UNDER THE INSURANCE ACT.

(BY OUR SPECIAL COMMISSIONER.)

(*Continued from p. 837.*)

XXI.—LEEDS: ACCEPTANCE OF THE ACT.

THOUGH so near to Bradford, the whole feeling at Leeds is absolutely different. This is not surprising, for there was no great hostility to the Act during its passage and very little faith in the capacity of any form of medical organisation to prevent the enactment and application of the new law. In the southern portion of the town all the practitioners had clubs; indeed, without club practice no medical man could have earned a living. With but very few exceptions all the South Leeds practitioners were in favour of working the Act after the terms had been raised. The same feeling prevailed in the other working-class districts, but some hostility was displayed so long as the British Medical Association was able to maintain a show of resistance. There was, however, very little feeling one way or the other, and there is not much now. One of the best-known practitioners on the panel attributed the present position of the medical profession to the tactics employed. "We were bound to be defeated," he said, "because we started out to bargain." The members of the medical profession should not have said they were prepared to do the work at a price. They should have held out on questions of principle and not haggled over sums of money. By discussing terms they set up a sort of Dutch auction. This is most dangerous, for a point is surely reached which satisfies some, though not all. Then the ranks must divide, with one part ready to accept and the other part still dissatisfied. The matter should have been fought out, not on the amount to be paid, but against the principle of contract work, which is exactly what was said in THE LANCET at the time.

Forming the Leeds Panel.

During the long disputes concerning the measure the medical men met in each other's houses in different districts, and when they attended central meetings they had already made up their minds how to vote for the most part. For some time it was decided not to work the Act, though there were always some who spoke in its favour. They were, however, invariably defeated by a large majority. Therefore, when the Leeds practitioners sent up a representative to the meeting of the Representative Body of the British Medical Association he was instructed to vote against working the Act. This he did, but he spoke in a different sense, as he had a perfect right to do, and on returning to Leeds, at a subsequent meeting of Leeds practitioners, he moved an amendment to a resolution advocating the policy of continued resistance to the effect that the Leeds practitioners should work the Act. The amendment was carried, assisted, I am told, by the misapprehensions of the proposal to negotiate with the Friendly Societies. The great majority of Leeds practitioners then went on the panel. The few who still held out also joined the panel when the British Medical Association liberated them from their pledge. Some among those who joined the panel late have suffered because they have not got many insured persons on their list. After the first six months there were 156,344 insured persons at Leeds out of a total population which is now believed to amount to 457,295. The panel consists of 180 medical men out of 267 in general practice, and no contracting out is allowed. Complaints have been received by the Insurance Committee from insured persons who say that they have not received the benefits to which they were entitled quickly enough; this seems to be the principal fault found by the public as to the working of the Act. What may happen is as follows. An insured person falls ill on Monday; he has to get his medical certificate on Thursday, and this must go to his Approved Society. If the certificate does not reach the secretary of the Approved Society to which the patient belongs before Friday it may be overlooked. Then comes Saturday and Sunday, which are barely working days, so the matter is put aside till the ensuing Monday, and thus more than a week may elapse before the patient receives any relief. As, however, he gets medical attention at once it is clear that too much importance must not be attached to such cases.

How to Manage a Long List.

The most sought after panel doctor in Leeds has, I am told, about 5000 insured persons on his list, not all resident in Leeds, as some live in the adjacent county. He has a partner to help him. In January, during the fortnight when the Act first came into force, he had 85 patients to see at his surgery or at their own homes. In February there were 100, and each month they have continued to increase. Yet most of the members applied during the first few days, and some hundreds gathered round and about the house. It was impossible to sign the cards while the crowd waited, so they were collected and the promise was made to post them. Thus the work was done with more leisure; but still it was necessary to employ two collectors and a bookkeeper, who entered the cards on the list. They filled up the record cards from the prescriptions. This is a hardship for the practitioner if he employs no clerical help. When the list of insured persons amounts to about 5000 it takes four or five days each month to draw up the statement the Insurance Committee requires, which gives the number of consultations and visits. To facilitate quick working the panel doctor may give each patient a special card which will be of a different colour every year. This saves time, as it will not be necessary when a patient calls to look up the books so as to see if he is still on the list. The colour of the card will answer that question. Then on each card the prescription is copied, thus again avoiding reference to books to ascertain what the treatment has been. But for some such methods it would be impossible to deal with a hundred or so patients who might crowd together in one day. Such systematic arrangements come naturally to good organisers experienced in dealing with crowds of people. It is a talent in itself, but one whose cultivation has never formed part of medical education. In the present instance the practitioner who with his partner has a list of some 5000 insured persons used to have a list of about 4000 club members before the Act came into force. Some of these club members paid 3*s.* 6*d.* a year, others 3*s.*, and some even less. To-day the majority of the club patients have become insured persons and the medical attendant obtains 7*s.* for each one of them. This, of course, represents a considerable increase of income and of work.

Quick Practice.

In regard to private practice among the working-class my informant had his books examined for a period of three years by an accountant. He found that the average income derived from working-class practice was about 7*s.* each. If the bill amounts to 10*s.* the medical attendant will get 6*s.* 9*d.*, the rest goes to cover the cost of bookkeeping, bad debts, collecting, drugs, &c. Probably half the insured persons on his list had found some pretext for calling on him. The feeling of curiosity which prompts a large proportion of such callers is dying out, and the visits to the patients' houses had not increased. Though these insured persons had given him a good deal of unnecessary trouble, still they represented 7*s.* a year each without bad debts. Whereas he did not get more, on an average, from the same class when they were ill and paid the minimum fees, and when they were well he got nothing at all. He recognised that the majority of the consultants and medical men practising in residential districts were against the Act. But this was a theoretical opposition, as he considered that the Act did not affect them. Those whom it did affect, especially the working class, felt that they were deriving very substantial benefits from the Act. In South Leeds the practitioners would have broken away had the resistance to the Act continued. The question of limiting the amount of work a panel doctor should be allowed to do was also a theory, good enough in its way, but unpractical in his view. I have already expressed a contrary opinion in these articles, but I admit that some medical men acquire, as a speciality in itself, the art of going quickly over a case. The proof that this does not mean that work quickly done is badly done is that the patients themselves flock to such doctors. Also when really necessary ample time is taken. To-day the latest methods of treatment were being used for insured patients. The Commissioners have not refused vaccine, and the popular panel doctor protested that there was no "scamping," though he might have to work 16 hours a day. Obviously, however, if a practitioner is giving 16 hours a day to his patients he is scamping the care of himself and relaxation necessary to the preservation of his health and the thousand and one other things that go to make life worth living and keep a man abreast of his time.

The Holiday Problem.

When the first Medical Committee was elected for Leeds the local division of the British Medical Association refused to act, and nominated a Local Medical Committee of its own. Therefore, the first official Medical Committee under the Act was formed by the panel doctors themselves. Now the Medical Committee has been re-elected, and properly this time, so that it does represent the profession as a whole, and seems disposed to protect professional interests. This may involve some actions at law so as to secure for the panel doctors the entire sum that has been promised. There is a tendency to tamper with their position sometimes. The chief apprehension is in regard to the holidays. In a manufacturing town this means a great deal. The working class does not go away from Leeds in a body as they do, for instance, from Oldham; but a great many do spend a week or more at some seaside resort. If a deduction is made from the 7*s.* for the medical attendance of these holiday makers this is a drain from the Leeds practitioner's income for which there will be no return whatsoever. There is no interchange of population—the holiday time is solid loss to the Leeds medical man on the panel. No holiday crowds come to Leeds. The Leeds artisan takes his family to Blackpool for a week; nobody ever comes for a holiday from Blackpool to Leeds. In many ways the Leeds practitioner, I gathered, does not feel safe. What, they inquire, will be sprung upon us and what will remain of the 7*s.* originally promised? Speaking to a well-known practitioner, who lives in a residential part of the town and has a mixed private practice and insurance practice, I found that in fine weather he was not much troubled with the 670 insured persons who had placed themselves on his list. During the four days previous to my visit he had only seen one out of the 670 insured persons. Nevertheless it is certain that the Insurance Act has increased largely the amount of work done, and many are receiving medical attendance who had never seen a doctor before. Some medical men in practice among the poor have had their incomes doubled. Formerly where in a very poor district it was difficult to earn £300 a year, now that the greater part of this population has been insured there is a safe £700 or £800 coming in to the practitioner. In fact, it is beginning to pay to attend to the poor, and this may lessen the congestion of medical practitioners in the residential districts. Altogether it may be said that at Leeds there has not been so much excitement over the Insurance Act as in other towns. Leeds is one of those towns where the majority of practitioners expect to benefit by the Act because the proportion of poor people is very large.

(To be continued.)

FAITH-HEALING.—An Irish correspondent writes: "Under the management of Messrs. Thomas Cook and Co. about 2000 Roman Catholic pilgrims have started to visit Lourdes. The last of these (160) left Belfast *viâ* Larne and Stranraer on the evening of Sept. 8th, mainly from various parts of the north of Ireland. Among them were 12 invalids from co. Armagh in charge of two trained nurses, some paralysed and others blind. On the morning of Sept. 9th 750 Roman Catholics from different parts of the diocese of Down and Connor (Ballymena, Larne, Ballyclare, &c.) also left Belfast in two trains for Lourdes, *viâ* Greenore. Some came to Belfast on the evening of Sept. 8th, staying in the Mater Hospital or with friends, while others travelled all the way from their homes in Antrim and Down on the morning of their departure by motor-cars lent by friends. The pilgrims, consisting of people of every age and sex, and with every type of chronic ailment, were most carefully looked after by an ambulance corps, under the charge of Dr. J. B. Moore, Sir Alexander Dempsey, M.D., and Dr. John A. Black, and by 12 Bon Secours nurses. It is certain that the change of scene and the journey taken under careful circumstances will work an improvement in some of these cases."

BRISTOL AND WESTERN COUNTIES.

(FROM OUR OWN CORRESPONDENTS.)

Public Health in Bristol during 1912.

Dr. D. S. Davies, medical officer of health of the city of Bristol, in his 1912 report makes several very interesting comments on the outbreaks of infectious disease noted during that year. Of small-pox he writes that a big outbreak would at any rate have the advantage of increasing the hospital accommodation, which is at present quite inadequate. During 1912 there were 62 cases, traceable in the main to introductions through the port. The scarlet fever figures afford a remarkable contrast to those of 50 years ago, when the city was less than half its present size; for the past four or five years the number of deaths per annum from this cause has not reached 20, whereas in 1863 and 1864 there were over 1100. Dr. Davies regards this reduction as due in large measure to judicious use of isolation in hospital. The most interesting statement with regard to enteric fever is to be found in an interim report by Professor I. Walker Hall, who has had a carrier under observation since 1909; he holds out hope of complete cure by the use of sensitised vaccines, which were administered from October, 1911, to February, 1912, since which date no organisms have appeared in the urine. An interesting summary of the diphtheria history of the city shows there was an increased incidence and mortality during 1899–1904, apparently due to the introduction of a more virulent type of bacillus into the city, at first into the southern areas only; these untoward figures have declined since. There is a very full account of the measures used to check the disease. Lastly, there is an interesting record of an outbreak of measles observed by Dr. E. K. Gawn; there were 16 cases, in each of which recurrence took place 16 or 17 days after the primary attack. In 1912 the deaths from pulmonary tuberculosis numbered 402, a rate of 111 per 100,000 population, as against 590, or 422 per 100,000 population in 1838. Dr. Davies does not expect that the measures recently introduced will end in the total extinction of the disease, though they may prolong many lives and limit some opportunities of infection. The number of notifications during 1912 amounted to 579. In an account of the work of the tuberculosis dispensary it is stated that of 463 contacts examined 130 were definitely consumptive, 133 were suffering from non-pulmonary tuberculosis, and 46 were suspect, so that only one-third were regarded as definitely free from tuberculosis. The high mortality from infantile diarrhœa which occurred during the hot summer of 1911 (407 cases) fell to its usual level during the rains of 1912 (66 cases). A further reduction in the infant mortality is, nevertheless, to be desired; the measures adopted recently with this end in view are the appointment of fully qualified lady health visitors, adoption of the Notification of Births Act, and extension of the schools for mothers, of which there are already two in Bristol. A third is to be opened shortly, and the whole movement will be under the control of a council, which will endeavour to start new schools in districts where they are needed.

Bristol General Hospital.

An interesting survey of the work of this institution during the first half of the current year was given by the chairman, Mr. Francis Sturge, at the governors' meeting. The principal event has, of course, been the death of the president of the hospital, Mr. Joseph Storrs Fry; no statement was made as to the name of his successor. The balance sheet shows a slight decrease in subscriptions but an increase in donations and workmen's contributions, an increase of £230 in expenditure being entirely accounted for by repairs. Two cots in the children's ward have been endowed. Mr. Sturge's remarks as to the effect of the Insurance Act were very interesting. In-patients show a marked increase—93 more than in the corresponding half of 1912, while there are about 3000 fewer out-patients. Rather more than one-third of the in-patients treated between March and June were insured persons, while in the out-patient department about 1000 insured persons had been seen, 400 of them being referred to their panel doctors. It should be added that the bulk of those who were not so referred were seen by the hospital staff at the request of, or in conjunction with, panel doctors.

Working Men and the Bristol Hospitals.

A conference representative of trade unions and other workers' organisations met recently in Bristol and adopted a scheme for the formation of a "Bristol Workers' Medical Institute Fund." This fund is to be formed by the subscriptions of individual working men or of bodies of workpeople; it is to be handed on to the various hospitals and medical institutions of the city in such proportions as the subscribers shall determine, but through nominated representatives. Each of these nominees is to be accredited with such a sum as will enable him to become a hospital governor. By this means the working men of Bristol intend to secure direct representation on the governing bodies of their hospitals, a form of power they have not hitherto enjoyed. It is not expected that the fund will assume commanding proportions for some time, but the importance of the movement, which has its counterpart in other large towns, is too obvious to call for explanation.

Sept. 16th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

The Incorporated Sanitary Association of Scotland.

THE thirty-ninth annual Congress of the Incorporated Sanitary Association of Scotland was held in Glasgow last week. Delegates, 356 in number, as against 282 last year, were present from 163 town and county councils and other public bodies. Bailie Paxton, senior magistrate of Glasgow, in the unavoidable absence of the Lord Provost, presided at the opening meeting of the Conference, and welcomed the members. On the evening of the first day a reception was given by the corporation in the City Chambers. The next evening was set aside for the annual dinner of the delegates held in the Grosvenor Restaurant, while Saturday was spent by members of the Congress on a cruise on the Firth of Clyde at the invitation of the corporation. At the preliminary business meeting it was reported that there were 34 life members of the association and 405 ordinary members. During the year 43 members were admitted, while the names of 41 persons were removed from the roll. The financial situation of the association continued to improve. The funds in hand at the close of last year amounted to £1127, and at the close of the current year to £1206. During the proceedings papers were read and discussions took place on many problems of vital interest to the community.

Dr. William Robertson, of Leith, President of the association, dealt with the problem of consumption in his presidential address. He spoke hopefully of the striking decline in the death-rate from this cause, but for complete eradication of the disease he did not look so much to notification, elaborately equipped sanatoria and dispensaries, as to the social elevation of the people. He referred especially to the conditions in rural districts where the children dwelling in picturesque but insanitary dwellings compared unfavourably with the average child from the city. Quite apart from the lack of ventilation in the rural cottages, one had only to follow the typical domestic cow to her domicile at the gable end of the cottage to realise why consumption was so rife in those districts. After dealing with the cost of consumption in money to the nation, he touched upon the relative improvements in the death-rate from this cause in the cities and large towns of Scotland.

Councillor Turner, of Glasgow, introduced the subject of the Municipalities and the Milk-supply, and an interesting paper was read by Mr. J. Lumsden Oatts, secretary of the Glasgow and District Dairymen's Association, on the question of Compensation for Dairymen. This last paper raised an interesting discussion as to the question of deciding in which cases the dairyman was in default, and it was suggested that it was a risk in his business which he himself ought to take. In a paper by Mr. James G. Reynard, M.R.C.V.S. (Perth), on the Tuberculosis Order, 1913, the general idea was that the Order was a step in the right direction, but was not nearly sufficient to check the disease to any appreciable extent. In connexion with this subject a

paper was read by Professor Dewar, of Edinburgh, on the Efficacy of the Tuberculin Test as Applied to Cows.

A large portion of the time of the Congress was devoted to the housing problem. Bailie Dr. Edward McConnell, of Glasgow, read a paper on What are the Best Means of Providing Houses in a Burgh for the Labouring Population? He pointed out that it could not be effected on a purely economic basis, and there could be no 5 or 6 per cent. return in such a type of house. To his mind, also, it was useless to build cottage dwellings or even flatted tenements for the city labouring classes in suburban areas two or three miles from the centre of the city. Discussing how or where the work of building or reconstructing houses for the poor could be best accomplished, he said that there were upwards of 21,000 ticketed houses in Glasgow, and it was amongst these that future clearances must be made. Dr. A. Campbell Munro, medical officer of Renfrewshire, in dealing with the question of publicly providing and letting houses at economic rates, stated that in his opinion the question of housing the labouring classes would never be solved until the principle of a minimum wage had been accepted. Part of the difficulty was also due to the failure of the labouring man to assign a fair proportion of his wages to rent, and his failure to keep his house in a fairly sanitary condition. The convener of the City Improvement Committee in Glasgow dealt with these in providing single-apartment houses at a rent of £6 5*s*., room and kitchen houses at £9 10*s*., and two rooms and kitchen houses at £16. Mr. John Mann, jun., secretary of the Glasgow Workmen's Dwellings Company, Limited, spoke on "the personal equation of the problem," and suggested coöperation between the three important sections dealing with the problem—the owners, their agents or factors, the tenants, and the officials of the local authority. Interesting papers were also read by Dr. C. R. Macdonald on the Agricultural Labourer, who was described as the nation's fittest physical unit, and on the Housing of Potato Diggers; and although the difficulty was recognised of satisfactorily housing so migratory a class, yet it was on all hands agreed that the powers of the local authorities under the existing law were insufficient to deal satisfactorily with the problem.

Early in the session a popular lecture was delivered by Mr. T. W. Drinkwater on Food and its Preparation.

Death of Professor Hugh Marshall.

Dr. Hugh Marshall, professor of chemistry in University College, Dundee (University of St. Andrews), died on Saturday, Sept. 6th.

Sept. 16th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

The Dread of Tuberculosis.

THE dread of tuberculosis is likely to interfere seriously with the efficient treatment of the disease. A public scare a few years ago prevented a much-needed addition to the Royal Hospital for Incurables in the Dublin suburbs, and it was in the face of bitter opposition that the Peamount Sanatorium, near Dublin, was erected last year. It is now reported that Lady Aberdeen is in treaty for the purchase of a private sanatorium in the Dublin mountains some six miles from the city for the purpose of establishing a home for crippled children on the same lines as the Treloar Homes at Alton, and already an outcry is being raised in the neighbourhood that the project is dangerous. It looks as if the treatment of tuberculosis for the Irish must be relegated in the future to uninhabited islands.

The Responsibility for Treatment of a Tuberculous Insured Person.

An interesting question has been raised in county Roscommon as to the responsibility for treatment of an insured person suffering from tuberculosis. It appears that a young man suffering from phthisis was sent by the County Insurance Committee to a sanatorium, whence he was returned after some months. The Insurance Committee declined to treat him any further on the ground, it is said, that his home was unsuitable for domiciliary treatment, and he was thereupon admitted to the union hospital. The guardians, quite naturally, think they should not be made responsible for the care of a tuberculous person whose claim to sanatorium benefit has been admitted by the Insurance Committee. The case has been referred to the Insurance Commissioners, whose decision will be of considerable importance as governing many similar cases which are likely to occur in Ireland.

The Refusal to Pay a Medical Fee: Curious Action of the Local Government Board.

An absurd instance of official stupidity has occurred in reference to the proposed payment of a fee to one of their medical officers, Mr. J. O'Dwyer, by the Granard board of guardians. He was on his annual leave, but had not left home when his assistance was requisitioned for an urgent operation in a dispensary case. The guardians ordered the payment of the usual fee of 2 guineas, but the Local Government Board intervened and refused to sanction the payment on the ground that Mr. O'Dwyer was on leave at the time. It is difficult to see the logic of their action.

The New Belfast Abattoir.

One of the latest public health developments in Belfast was completed on Sept. 10th, when the Lord Mayor of the city, Mr. R. J. McMordie, M.P., opened the new municipal public abattoir, at the request of the chairman of the markets committee, Councillor Dr. Henry O'Neill, in the presence of a large company who afterwards inspected the buildings. For a period of 17 years there has been a movement to build a new abattoir in Belfast, and at last, in 1909, the city council sanctioned a scheme in accordance with plans modelled largely—but with distinct improvements—upon the system in force in Berlin. The site, in close proximity to the markets, cattle sale yards, and railways, occupies a little more than three acres, and on it have been erected buildings with the most modern machinery and, in many respects, original equipment, at a cost of £52,000, for the slaughter of cattle, sheep, and pigs. Each of these departments has been kept separate—that is to say, there is a separate lairage, slaughter-hall, and hanging-hall for each kind of animal, the offal only being dealt with in common. Accommodation is provided in these lairages for 250 cattle, 200 pigs, and 850 sheep. An inspection of the various rooms shows that every possible precaution has been taken to secure proper inspection, perfect cleanliness, and humane slaughtering of the animals. Further, there are two isolated stalls for animals suspected of disease, a separate slaughter-room, and hanging-room for suspected meat, and a condemned meat room containing a digester for dealing with meat unfit for food. After the opening of the abattoir Dr. O'Neill entertained the corporation and a number of leading citizens to luncheon in the City Hall, when the Lord Mayor, in proposing "Success to the New Abattoir," paid a high and deserved tribute to Dr. O'Neill's services in working so assiduously to obtain the abattoir and to secure legitimate control for the corporation over the meat-supply of the city. In reply Dr. O'Neill hoped that the citizens of Belfast would assist the corporation in providing a pure meat-supply by requiring on the meat before they purchased it the stamp of the inspection department of the corporation, showing that the meat had been carefully and properly examined and declared fit for human food by competent and trained officials.

James Hugh Fergusson, F.R.C.S.Irel.

I regret to announce the death, after several months' illness, of Mr. James Hugh Fergusson, superintendent medical officer of health of Londonderry. Educated at Queen's College, Belfast, and at University College, London, Mr. Fergusson became L.R.C.P. Edin. in 1880 and L.F.P.S. Glasg. in the same year. In 1894 he took the Fellowship of the Royal College of Surgeons in Ireland and in 1896 the D.P.H. of the same body. He practised at first in Killygordon, co. Donegal—he was a co. Donegal man—but, having devoted special attention to public health administration, he was elected 12 years ago, when the office was first created, to the position of superintendent medical officer of health of Londonderry, where his work was greatly appreciated and where he was successful in reducing infant mortality. Mr. Fergusson, who was for a time an examiner in the College of Surgeons, is survived by a widow and four children.

Sept. 16th.

SWITZERLAND.

(FROM OUR OWN CORRESPONDENT.)

Heliotherapy in Surgical Tuberculosis.

Dr. Rollier, of Leysin (Canton de Vaud), has recently published in a volume of the Annals of the Swiss Society of Balneology full details of his sun-bath treatment of surgical tuberculosis. Although Herodotus (484 B.C.) and Antyllus (300 A.D.) praised the good effects of sun-baths, this method of treatment remained until recent times in the hands of quacks. Perhaps Rickli and Finsen have done most to attract the attention of the profession to the good effects of heliotherapy. Bonnet, in 1840, Ollier and Poncet, of Lyons, first wrote on the value of sun-baths in tuberculosis of the joints. A pupil of the latter, Dr. Millon, wrote an inaugural dissertation in 1899 entitled "L'Héliothérapie comme Traitement des Tuberculoses Articulaires." Many others have followed in his steps, amongst whom may be mentioned the names of Vidal (Hyères), Bourcart, Revilet (Cannes), Imida, Chiais, Monteins, Malgat (Nice), and Bernhard (Samaden). Dr. Rollier has made use of this method in Leysin, with its exceptional amount of sunshine, during the last 10 years, and reports on 650 cases thus treated in his three clinics situated at altitudes of 1250, 1350, and 1500 metres, and now accommodating 200 adults and 150 children. Of course, the stimulating Alpine air must also be taken into consideration. Dr. Rollier is of opinion that all closed forms of surgical tuberculosis heal if treated long enough, and publishes photographs of patients. He considers active surgical interference to double the danger and employs aspiration of pus only in certain cases. Only 7 out of 650 cases received operative interference. All the cases reported as healed were carefully controlled by skiagrams; cases clinically healed or quiescent are registered only as improved. The 650 cases refer to 355 adults and 295 children. Out of 450 "closed" cases 393 were cured, 41 improved, and 11 remained stationary. Of 200 "open" cases 137 were cured, 29 improved, and 14 were stationary. As regards the method, Dr. Rollier reports as follows. The first few days are days of complete rest and are devoted to the process of acclimatisation. Then, beginning at the feet, and at first only three times a day for five minutes, the body is successively exposed to the influence of the sun. Thus eczema or inflammation is always avoided. The rapidity of pigmentation generally coincides with a more rapid cure. The following table refers to the most interesting cases:—

—		Cured.	Improved.	Stationary.	Died.	Total number of cases.
Spondylitis	Without abscess	45	7	—	1	53
	With "	24	1	1	2	28
Coxitis	Without "	36	3	—	—	39
	With "	15	2	1	—	18
	Secondary infection	8	6	3	7	24
Gonitis	Without abscess	46	2	2	—	50
	With "	7	2	—	—	9
	Secondary infection	6	1	1	—	8
Osteitis	Closed	21	4	—	—	25
	Secondary infection	32	2	—	1	35
Tuberculous peritonitis		32	5	4	4	45
Tuberculosis of kidneys		11	7	2	—	20
" after nephrectomy		6	2	2	—	10
Adenitis tracheo-bronchialis	Without abscess	36	3	—	1	40
	With "	16	—	—	—	16
	With secondary infection	29	3	—	—	32
Scrofuloderma and lupus		10	3	—	—	13

The spondylitis cases were treated with immobilisation by means of linen bands easily removed. Cold abscesses often became absorbed rapidly; in some cases aspiration was performed. The convalescent patients wore a celluloid corsage easy to remove. Coxitis and gonitis are treated by permanent extension; the functional results, even in cases of 5–10 years' standing, were remarkable. Methodical active contraction of the quadriceps muscles prevented atrophy. The return of movement in the joints came on spontaneously without any aid by active or passive movements. Glandular swellings were absorbed rapidly; fistulas dried up; sequestration of bone took place spontaneously in all but three cases, in which surgical interference was resorted to. Dr. Franzoni has reported at length on the process of sequestration. Tuberculous peritonitis, especially the caseous glandular forms, healed well. Neither puncture nor laparotomy was resorted to. Ileocæcal fistulas also closed. One very severe case which had produced almost complete stenosis of the intestinal canal, and in which Professor Roux declined to operate, benefited so greatly in the course of a year's treatment that Professor Roux could detect nothing pathological. The duration of the treatment in general varied from half a year to two years and more.

Zürich, Sept. 11th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Destruction of Flies.

THE Conseil d'Hygiène et de Salubrité of the Department of the Seine having instructed Dr. Vaillard, a medical inspector-general of the army and president of the Army Sanitary Committee, to make a special study of the part played by flies in the dissemination of infectious diseases, Dr. Vaillard has formulated some practical measures for their destruction. A mixture of 15 per cent. of commercial formol, 25 per cent. of milk, and 60 per cent. of water, with a little sugar, is to be disposed about the rooms in wide shallow dishes. Flies, attracted by the milk, readily drink this and die almost immediately. The mixture can be used for several days. Cresol fumigations also may be used. When evaporated by heat over an alcohol lamp cresol gives off abundant fumes, which are very toxic for flies and mosquitoes. Dr. Vaillard recommends the protection of dwellings against the invasion of flies as well as the destruction of those that gain access. These are excellent, but only palliative, measures. The essential thing consists in preventing their propagation and destroying the foci of incubation. To this end garbage accumulations should be suppressed as far as possible, and larvicides should be used. Dunghills and stables should be sprinkled with freshly prepared solution of slaked lime. Quicklime should be used in privies, as is done in America. The larvæ may be destroyed and the egg-laying females dispersed by treating privies with a mixture, briskly shaken, of equal parts of natural schist oil (*huile de schiste brute*) and water.

The Treatment of Adder Bites.

Dr. Guyot recommends this treatment for adder bites. On the occurrence of the bite the first thing is to prevent absorption, to localise the poison, and to combat its action by suction; but a similar practice, which is too much used, has its dangers. To retard absorption the application of a constricting band on the proximal side of the bite is efficacious. To destroy the poison the application to the wound of antiseptic solutions was recommended by Lacerda, who used for this purpose 1 per cent. solutions of potassium permanganate. But, according to Dr. Guyot, this drug also reduces absorption by a purely physical agglutinating property, rendering the poison insoluble. Were its action purely antiseptic, due merely to its oxidising power, oxygenated water would be preferable, or the peroxides or perborates; a solution of colloidal silver also would have the same result. Among other chemical preparations recommended a solution of chromic acid deserves attention. Chromic acid is both a caustic and an oxidiser. According to Cerbelaud, a 1 per cent. solution would be analogous to the formula of the outfit (*trousse*) of Michel Legros, which is much used for viper bites. The technique consists in injecting a cubic centimetre of the solution, divided into three or four injections, one into the bite, a second at the edge of the swelling, the third and fourth peripherally. These injections are very painful, and should be made as quickly as possible after the bite—the maximum time being

four hours after. But the only really efficacious and rational method is the physiological one—Calmette's serum, which is obtained by progressive immunisation of horses with increasing doses of snake-poison. Ten cubic centimetres of this serum are injected hypodermically not later than four hours after the bite. Calmette's serum being very unstable, efforts have been made to desiccate it. The result is known as Fraser's serum, and it is dissolved when wanted for use in boiled distilled water. The use of specific measures must not, however, do away with general measures for the elimination of the poison, such as purgatives, emetics, and diaphoretics, and the use of stimulants, such as ether, caffeine, and camphorated oil, to overcome the depression.

A Novel Enterprise of Quacks.

For some time the peasant proprietors in France have been receiving a circular entitled "Cadeau Musical." This circular announces that to obtain a free gift of a pretty piece of music for the piano and the voice the names and addresses of 20 persons having any of the following affections should be sent to a certain person in Paris whose address is appended. A list of the principal diseases, including asthma, diabetes, lameness, and eczema, follows. Two pieces are offered for 40 addresses, three for 60, &c., and secrecy is guaranteed as to the furnisher of the addresses. The use that will be made by quacks of addresses thus furnished may be easily guessed.

Sept. 15th.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

National Society for Preventing the Spread of Venereal Diseases.

THE inaugural meeting of the National Society for the Prevention of the Spread of Venereal Diseases was held recently under the presidency of Professor Julius Donath. In his introductory address the President assured his hearers that the society would not deal with the treatment of cases, but its activity would be restricted to prophylactic work. He said that the coöperation of the medical and communal authorities was absolutely necessary for success, because the damage to public health caused by venereal diseases in Hungary was immense. Dr. Weiss Emil, editor of the *Egészségügyi Lapok* (*Sanitary Officer's Journal*) read a paper entitled "How to Prevent the Infection of School Children with Venereal Diseases." He pointed out that in Hungary the instruction of children in sexual matters was quite unknown—at least as far as parents were concerned—and the discussion of the subject with juveniles after they have left school was rather late. On the other hand, the enlightenment of boys under 14 or 15 years of age was too early. He did not support the idea of discussing sexual questions in school, but he recommended as an auxiliary solution of the problem that at least once in a year parents should be invited to attend a meeting at which they would be advised how to act. Young persons proceeding with their education in Hungary ought to be under supervision not only as regards their morality, but also as regards their health. Where there were no school medical officers the National Society for Preventing the Spread of Venereal Diseases would bear the expense of engaging medical experts who would carry out its recommendations. The direct enlightenment would be deferred until after the maturity examinations. Dr. Biró Ede, of the army medical staff, spoke on the present system of teaching soldiers how to avoid venereal diseases. He said that soldiers leaving the service and returning home were very apt to communicate venereal diseases, and he asked the President to appoint a committee to consider how this could be prevented. The society has resolved to establish venereal dispensaries in some of the largest cities of the country; the first one will be opened in October.

The Manufacture of Soda-water.

The Minister of Public Hygiene, having regard to the threatening cholera epidemic, has issued an order to all medical officers of the country to visit the soda-water factories in their districts and insist on the utmost attention being paid to the use of pure water and the generation of carbonic acid gas from pure materials. Soda-water must not be supplied to the public in bottles larger than half a litre (rather less than an imperial pint). Syphons must be made of glass, porcelain, nickel, or aluminium. In the whole country at least 300 soda-water factories have been closed on account of their water-supply not being up to the standard.

Proposed Restrictions on the Sale of Rifles.

In view of the very numerous cases in which persons have taken, or attempted to take, their lives by shooting themselves with rifles, these weapons being sold here without any restriction, it is not surprising that a movement is in progress which, it may be hoped, will result in a Bill being brought before Parliament to check their indiscriminate sale. The leader of the movement, a Member of Parliament, said that the community might claim that as the law punished with the utmost rigour even the smallest transgression of the hygienic regulations it equally ought not to allow juveniles and excited persons to buy rifles, which were used with fatal effect both in public places and in private houses.

The Relation of Athletic Exercises to Dilatation of the Heart.

Dr. Bender has examined the hearts of 250 athletes and 300 students, the latter after they had taken one hour's continuous exercise. His examination was restricted chiefly to defining the outlines of the heart by the X rays and otherwise. He found that of those persons who had been taking part in athletic sports and active bodily exercises for a year or two the majority manifested some dilatation of the heart, which, however, did not interfere with their health at all. On account of this observation he was inclined to regard such dilatation as a semi-physiological condition with those who are habituated to athletic sports and exercises. His conclusion is that such exercises, even when decidedly energetic, are not injurious, because the vascular system and the cardiac action gradually adapt themselves to the slight dilatation. Neither does arterio-sclerosis occur in a greater percentage in athletes than among other persons. Of course, all these remarks relate to normal and healthy subjects and not to persons suffering from illness or debility. Neither can they apply to people who are addicted to any excesses or to over-indulgence in alcohol or tobacco. On the ground of his investigations Dr. Bender would discard the term "sport heart" as used on the continent for cardiac dilatation in athletes.

Sept. 13th.

PITCH CANCER IN WALES.—For several years the occurrence among some of the men employed in the making of briquettes or patent fuel of an eczematous ulceration, which has been termed pitch cancer, has been causing some concern among the manufacturers engaged in the industry as well as in the medical department of the Home Office. Mr. A. H. Lush, a commissioner appointed by the Home Secretary to inquire into the scope of possible regulations, made several important suggestions, to which allusion has been already made in THE LANCET. Among these was the installation of baths at some of the factories in Cardiff and Swansea, in the use of which volunteers among the men should be sought in order that a trial might be made of the effect of a daily bath after work. This suggestion was carried out on a limited scale, and Mr. Lush has now reported on the result. When making the proposal he stated that in Cardiff there was a strong feeling among the men against taking the baths, and some of them said they would give up their employment if compelled to do so. After making the trial this feeling is still predominant, most of the men who used the baths declaring that they suffered great agony every day, notwithstanding which, however, they persevered with the baths for many months without any apparent necessity or inducement. In Swansea, on the other hand, the men were favourably impressed with the advantages attending the use of the baths, though they were averse to being compelled to bathe. Under the circumstances Mr. Lush advises that the draft regulations in which bathing was made compulsory should be withdrawn. He is evidently influenced in the matter by the prospect which he refers to of some method being devised for eliminating from the tar used in the manufacture of the briquettes the mischievous agent which is the cause of the warts and ulcerations to which the workers are subject. It may therefore be necessary to regulate the manufacture of the tar and not of the briquettes.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

UNDER the presidency of Sir Oliver Lodge, F.R.S., Principal of Birmingham University, on Sept. 10th the British Association for the Advancement of Science met for the fifth time in Birmingham, when many men and women of science, highly distinguished in their several branches, were present. On the first day 2506 associates and members were registered.

The University of Birmingham honoured with the degree of LL.D. Madame Curie, Professor H. A. Lorentz, of Leyden, Dr. S. A. Arrhenius, of Stockholm, Professor Keibel, of Freiburg, and Professor R. W. Wood, of Baltimore. Madame Curie had a great reception and Sir Oliver Lodge's tribute was paid in the following words: "The discoverer of radium, director of the Physical Laboratory at the Sorbonne, and member of the Imperial Academy of Science at Cracow. All the world knows how Madame Curie, inspired by the spontaneous radio-activity newly discovered by Becquerel, began in 1896 a metrical examination of the radio-activity of minerals of all kinds; and how, when a uranium residue showed a value larger than could have been expected from its uranium content, she, with exemplary skill and preseverance, worked down some tons of this material, chemically dividing it and retaining always the more radio-active portion until she obtained evidence first of the new element, which she christened polonium in memory of her own country, and then after months of labour succeeded in isolating a few grains of the other and more permanent substance now so famous—a substance which not only exhibits physical energy in a new form, but is likely to be of service to suffering humanity. Of the metallic base of this substance she determined the atomic weight, finding a place for it in Mendeleeff's series; and with the aid of her husband, whose lamented death was so great a blow to science, she proceeded to discover many of its singular properties, some of them so extraordinary as to rivet the attention of the world—the greatest woman of science of all time."

A Handbook to Birmingham was prepared for the Association under the editorship of Dr. George A. Auden, consisting of some 600 pages descriptive of the city from the historical, municipal, educational, industrial, and scientific standpoints respectively. Birmingham possesses many features rendering it particularly suitable for the meetings of this Association, which constitutes as it were a transformer whereby the energy of abstract study may be converted into applied science. As a university city it is in close touch with scientific investigation and study, while as one of our greatest manufacturing and commercial centres it is naturally a headquarters for the application of scientific principles to industrial and other needs. The practical facilities offered for the meeting were good, as Mason's College alone was able to accommodate no fewer than seven out of the 12 sections, the remainder finding a home in Queen's College, the Midland Institute, the Technical College, and the Temperance Hall. For the general meeting place the Town-hall was selected. As for entertainments, with Stratford-on-Avon, Warwick and Leamington, Kenilworth, the Forest of Arden, Tewkesbury, Evesham, Banbury, Lichfield, Droitwich, Worcester, Aston Hall, Oscott College, and Malvern within comparatively easy reach, the excursions which form so delightful and fruitful a feature of these gatherings found ample resources to draw on.

Sir OLIVER LODGE'S Presidential Address was awaited with expectant interest and curiosity. As a large part of it was published in THE LANCET of Sept. 13th and commented on editorially, reference to it here is unnecessary, further than to state that it was received with wide respect and admiration. Although the views advanced, as was doubtless expected no less by Sir Oliver Lodge himself than by others, will hardly command universal or unqualified assent, it was an arresting discourse in fine style and admirably delivered.

THE PROCEEDINGS IN THE SECTIONS.

The proceedings were conducted in 12 sections. Of these the sections that were of most interest to the medical profession were those of Mathematics and Physical Science, presided over by Dr. H. F. Baker, F.R.S.; Chemistry, by Professor W. Palmer Wynne, F.R.S.; Anthropology, by Sir Richard Temple; and Physiology, by Dr. F. Gowland Hopkins, F.R.S.[1]; though certain papers and discussions in other sections, notably Economic Science and Education, also bore upon the problems that engage the attention of the medical profession. Psychology, instead of being an incident in the section of Physiology this year, was promoted, largely owing to the initiative of Dr. S. C. Myers, of Cambridge, to the dignity of a subsection, and was remarkable for many papers on applied psychology in regard to education, mental defectives, sex relations, and nervous and mental diseases. Many women took part in the proceedings of this subsection, which held a joint meeting on Sept. 12th with the Section of Physiology.

Of the sectional Presidential Addresses, Dr. H. F. BAKER'S address in the Section of Mathematics and Physical Science constituted a plea for pure mathematics, which he described as the "essence and soul of all the sciences." Professor W. P. WYNNE, in the Section of Chemistry, confined his observations to a consideration of molecular replacement, stating that it was by no means yet settled as to what was the nature of the replacement of one radicle by another. Dr. H. F. GADOW, in the Section of Zoology, discussed Old and New Aims and Methods of Morphology, and urged the importance of greater attention to the investigation of function, which not only shaped, but created, the organ. In the Section of Anthropology Sir RICHARD TEMPLE urged the importance of a study of this science by those who were called to act as administrators in alien lands; while in the Section of Education Principal E. H. GRIFFITHS reviewed the present educational system, insisting that greater attention should be paid to the formation of character, and expressing the opinion that great benefit would accrue from the appointment of such a man as Sir R. Baden Powell, the originator of the Boy Scout movement, as Minister of Education

Of the reports presented and papers read we need only mention a few of more particular medical interest, especially as the accounts of the sectional meetings in the lay press have been so full and accurate; but the debate in the Section of Physiology upon the report of the Anæsthetics Committee requires full notice.

Section of Physiology: The Debate upon the Report of the Anæsthetics Committee.

At the conclusion of Dr. Gowland Hopkins's address, Professor A. D. WALLER presented the annual report of the committee, of which he was chairman, which had been appointed "to acquire further knowledge, clinical and experimental, concerning anæsthetics—especially chloroform, ether, and alcohol—with special reference to deaths by or during anæsthesia, and their possible diminution." He said that the main consideration which had led to the formation of this committee was that preventable and unnecessary deaths were taking place year by year, and the association desired to do something towards the alleviation of this misfortune. The essential feature of the present report was an appendix by Sir Frederic Hewitt which dealt with three coroners' inquests upon members of the working classes who during the first five months of the present year had died as the result of cocaine injections administered by unregistered dentists. The cases were very similar in many respects. At one of the inquests the jury asked the coroner to severely censure the operator. At one of the others the jury added to the verdict a recommendation "that the law should be so amended as to prohibit the use of anæsthetics except by fully qualified practitioners," and this recommendation was communicated to the Home Office. The Sectional Committee would be asked to recommend the council of the association to make representations to the Government in favour of legislation to protect the public against the risks associated with the use of anæsthetics by unregistered practitioners.

[1] Dr. Gowland Hopkins's Presidential Address to his section is published in THE LANCET this week.

Sir FREDERIC HEWITT thanked the Section of Physiology on behalf of all those who were interested in the reform movement under consideration for allowing such ample facilities for the discussion of this important question. Thanks were also due to Professor Waller, not only for the great help which he, as a physiologist, had been able to render to the committee, but for the interest he had for many years displayed in all matters connected with anæsthesia. The questions before the committee had a scientific side, a professional side, and a public side, and the present report dealt principally with the last named. As one of the objects of the British Association was "the removal of any disadvantage of a public kind" it must be perfectly clear to all who had read the report that the association would be conferring a lasting benefit upon the public if it could in any way help to alter the present state of the law by which any unqualified person was allowed to administer any anæsthetic to his fellow beings. It was a curious fact that the great majority of people were under the impression that the public were already protected against this particular danger. But this was not so. It was to be feared, indeed, that the present highly unsatisfactory state of the law, which permitted any ignorant and untrained person to administer any drug so as to produce general or local insensibility to pain during a surgical operation, would continue to exist unless some strong and united protest were made. Was there any organisation or institution more fitted than the British Association to urge the Government to action? And was there any section of that association which was more fitted than the Physiological Section to take upon itself the responsibility of advising the council of the association as to the necessity for this action? He here reminded the meeting that after a considerable amount of spade work on the part of those who had this reform at heart they were in a position to state that every official and professional body which had been consulted as to the desirability of legally protecting the public against unqualified practice in anæsthetics had agreed in supporting the movement. The present state of the law almost verged upon the ludicrous. To find a parallel in other spheres of human activity they would have to imagine our railway companies permitting their porters or cloak-room attendants to drive their express trains or work their signals. Would such a state of things be tolerated by the public for one instant? Certainly not. And yet the risks connected with anæsthetics—when both general and local were included—were certainly greater than those of railway travelling. It should be our endeavour to make the risks about equal. Was it to be counted a trifling matter that during the first five months of the present year there were no less than three inquests upon poor ignorant women, who from lack of protective legislation in regard to anæsthetics had lost their lives? To argue that the public, before obtaining medical or dental advice, should consult registers in order to ascertain the fitness or qualification of the doctor or dentist seemed to him to betray a lamentable absence of common-sense. Whilst a member of a West-end club might consult a medical or dental register before obtaining professional aid, how was the poor working man or woman to distinguish between the regular and the irregular practitioner? It was for the Government to protect the public, not for the public to protect the Government. When it was remembered that the Home Office Departmental Committee had strongly urged the need for this legislation, and that, in addition to the British Association, the General Medical Council, the British Medical Association, the Royal College of Surgeons of England, the British Dental Association, and the Medico-Legal Society had one and all agreed as to the main provisions which should be embodied in an Anæsthetics Act, it was surely high time for the Government to take action in the matter, and to introduce legislation forthwith. The only opposition to such legislation would come, as might be expected, from the large number of unregistered dentists who now, without let or hindrance, exploited and victimised the lower classes of the community. This was not an occasion upon which to draw attention to the numerous and cunningly devised means by which money was extracted from the pockets of the poorer classes for dental treatment which proved to be utterly valueless. The point before them now was that by permitting untrained and ignorant persons to inject such powerful drugs as cocaine and allied analgesics prior to tooth extraction, a very grave public danger was incurred, and one that should be removed by prompt and decisive Government action, irrespective of all party considerations. The one criticism which was formerly levelled at all attempts to place dental anæsthetics in the hands of registered dentists—viz., that the latter would be, by reason of their comparatively small number, insufficient for the needs of the population—might fortunately now be met, for it had recently been demonstrated that by means of so-called "Public Dental Services," such as that now in operation in and around Reading, the poorer classes might obtain adequate dental treatment by registered practitioners at fees easily within their reach.

Professor H. G. BARLING said he was entirely in favour of the resolution which it was proposed to send to the council of the association, and hoped it might have some effect. It was deplorable that in this country a great deal of time was devoted to the discussion of matters which did not touch life, while there was very little time devoted to important matters which touched life very closely. He protested against the way in which ignorant persons took upon themselves the responsibility of giving drugs of which they knew nothing.

Dr. J. BLUMFELD said it was sufficiently terrible even if a few lives were sacrificed annually from causes that should be, and ought to be, easily prevented. The science and art of anæsthetics were still largely in the making, but by drawing public attention to the question there would be a rise in educational standards and better comprehension of the whole subject both within the ranks of the medical profession and also outside that body.

Dr. W. J. MCCARDIE said he had made inquiries as to the quantities of dangerous drugs used by unregistered practitioners and had found that while chloroform was employed very little, nitrous oxide and cocaine were purchased from the manufacturers upon a huge scale. Cocaine injections were used very frequently in cases in which injection was inadvisable or even dangerous. Dangerous drugs were sold by qualified chemists, yet their administration, which was a more serious matter, could be undertaken by unqualified persons. One result of this was that many men were being tempted to leave their professional studies in the dental curriculum and were becoming irregular practitioners. He read a letter from Professor Saundby (who was unable to be present) strongly supporting the movement in favour of immediate legislation which should include in its scope the prohibition of the injection of cocaine and similar analgesics by unregistered persons. Professor Saundby desired to remind the meeting that the General Medical Council, the British Medical Association, and the Royal Colleges were strongly in favour of legislation.

Mr. F. J. PEARCE, speaking on behalf of the British Dental Association, insisted that the movement in favour of legislation was being promoted without there being any wish to deprive the public of their right to the alleviation of pain, but with a desire to warn them against the administration of drugs by unqualified persons. The use of these drugs had enormously increased, and the only practical safeguard was to make their administration impossible save by qualified medical or dental practitioners. When deaths occurred at the hands of unqualified persons nothing happened beyond the utterance of a pious remark by a judge or a coroner. The three chief reasons why such regulations were necessary were: (1) that expert knowledge was required in order to ascertain the patient's fitness for an anæsthetic; (2) that the operation required surgical cleanliness and a knowledge of anatomy; and (3) that a knowledge of drugs was essential if catastrophes were to be avoided. He said that it was a mistake to make light of tooth extraction.

Mr. H. P. JOCELYNE, honorary secretary of the Midland Counties Branch of the British Dental Association, said that the deaths which came to light were only a drop in the ocean compared with the various forms of damage caused by unqualified practice. It was their duty to warn the public. There were about 20,000 unregistered dentists, and their number was increasing, whereas the number of qualified men remained where it was 40 years ago at 5000. In consequence of this the position was that only the richer members of the public were treated by properly qualified men.

Professor LEONARD HILL said that the newspapers were greatly to blame. They would not take the matter up, as a large part of their revenue was derived from advertisements of unqualified dentists and of vendors of patent medicines. It

would be against their own interests for the newspapers to report the cases where death was due to the administration of an anæsthetic by an unqualified man. Parliament, he added, took no action because Members of Parliament only attended to the matters which the newspapers brought before the people.

The Ductless Glands.

To the Section of Physiology the committee, consisting of Sir E. A. Schäfer (chairman), Professor Swale Vincent (secretary), Professor A. B. Macallum, Dr. L. E. Shore, and Mrs. W. H. Thompson, presented its report, drawn up by the secretary, stating that a study of the distribution and the detailed histology of the accessory cortical adrenal bodies had been commenced by the secretary, but as this involved a large amount of serial section cutting the work had not progressed far, and there were no new facts to report. An investigation into the histological changes in the thyroids and parathyroids and some other ductless glands under varying physiological and pathological conditions (different diets, starvation, poisons, &c.) had been undertaken. Mr. Cameron had been testing Hunter's method of iodine estimation in organic substances. It was satisfactory for moderate amounts, such as are found in the sheep's thyroid. It was not satisfactory for very slight traces. An initial attempt had been made to correlate other tissues with the thyroid as regarded iodine content, but no definite results had yet been obtained. The presence of iodine in the thyroid of frogs, fishes, and reptiles was under investigation, with the assistance of Mrs. Thompson. This chemical work was preliminary to a thorough investigation (by means of metabolism experiments) of the rôle of iodine in the animal economy. The committee asked to be reappointed with a grant of £40.

Colour Vision and Colour Blindness.

To the same section the committee, consisting of Professor E. H. Starling (chairman), Dr. F. W. Edridge-Green (secretary), Professor Leonard Hill, Professor A. W. Porter, and Professor A. D. Waller, presented its report, drawn up by the secretary, stating that the inadequacy of the wool test (even with additional colours) for colour blindness was now established. On April 1st the Board of Trade had adopted a lantern test for colour blindness in addition to the wool test. The total number examined by the Board in colour vision from April 1st to May 31st was 1689, and of these 105, or 6·22 per cent., failed. Of the 105 failures, 55 failed in both the wool test and lantern test, and 50 in the lantern only. None failed in the wool test only. The four chief colour names (red, yellow, green, and blue) must be used in any test for colour blindness, and if a daylight test were required, the bead test of Edridge-Green was preferable. The chief difficulty from a practical point of view was the line at which rejection should take place, as there was every grade of transition between total colour blindness and the normal colour sense. If a large number of persons were examined with the Edridge-Green lantern about 25 per cent. showed defects of colour perception. In the majority of cases these defects were slight, therefore it was necessary to know the nearest distance at which a coloured light must be recognised—i.e., the exact degree of colour weakness which was permissible—and that the line of rejection should be fixed accordingly. A man having even a slight defect of colour perception was not quite so efficient as one not possessing this defect; this particularly applied to the shortening of the red end of the spectrum, which prevented the recognition of red light at the normal distance, particularly when obscured by fog. The committee recommended that it be reappointed.

Egyptian Incubators.

In the Section of Agriculture an interesting paper was that of Mr. W. H. CADMAN on the Artificial Incubating Establishments of the Egyptians. The art of hatching fowls' eggs by heat originated in Egypt, probably about 3000 B.C., and had continued ever since, being handed down as a mystery in families. He described the incubator buildings, of which in 1911 there were 512, calculating that some 185 million eggs were put into them annually, and 120 millions of chickens taken out—a much superior result to that obtained by our modern incubators. The fuel used was dried cakes of chopped straw mixed with the dung of cows, buffaloes, camels, and other domestic animals, which burned very slowly and evenly without going out. He predicted that the adoption of the Egyptian incubator would prove highly remunerative.

(To be continued.)

THE NATIONAL INSURANCE ACT.

THE APPOINTMENT OF MEDICAL OFFICERS (MEN AND WOMEN) UNDER THE ACT.

AN advertisement has appeared recently in our columns inviting applications to the National Health Insurance Commission (England) from medical men and women desiring to serve as medical officers under the Act at salaries ranging from £500 to £800 per annum, the appointments carrying pensions. The particulars of these appointments have now been made public by the Commissioners in a document which does not purport to be an exhaustive statement of the duties and conditions of service of the officers to be appointed. The officers will be subject to all the rules applying to the Civil Service generally, and the object of the memorandum which follows is merely to enable the candidate to form an idea of the main conditions attaching to the appointments.

1. *General.*

There are at the present time vacancies for four medical officers, of which three will be filled by men and one by a woman. Applications must be made on the prescribed form, and no application will be considered unless received on that form by Oct. 13th, 1913. The form can be obtained only by written application addressed to the Secretary, National Health Insurance Commission (England), Buckingham Gate, London, S.W. Candidates must be registered medical practitioners of not less than ten years' standing who have had experience of general practice; in the case of women (who must be unmarried or widows) seven years' standing will be accepted. Other things being equal, preference will be given to those of not more than 50 years of age. Candidates who appear from their applications to be the most suitable will be required to present themselves for interview, and the successful candidates will, before appointment, be required to undergo a strict examination as to physical fitness. No travelling or other expenses can be allowed to candidates invited to attend such interview or examination. The candidates appointed will be required to take up their duties at the earliest possible date.

2. *Salary.*

The salary will be £500 per annum; after three years £600; after five more years £700; and after another five years £800 per annum. The increments of salary above mentioned will in all cases be subject to the work and conduct of the officer concerned being regarded as satisfactory. Salaries will be paid quarterly, but an advance of not more than 8 per cent. of the annual salary will be made in each of the first two months of the quarter.

3. *Duties and Conditions of Service.*

Medical officers will be required to devote their whole time to the public service. They will be required to make inquiries in connexion with the administration of the health provisions of the National Insurance Acts, to advise the Commission on matters requiring medical knowledge, to prepare statistical and other reports for the Commission, and to carry out such other administrative duties as may be assigned to them by the Commission. They will be required to travel and to live at such headquarters as may from time to time be approved by the Commission, and it must be distinctly understood that it is one of the conditions of appointment that each officer must be prepared to work where directed to do so from time to time by the Commission. No removal expenses can be allowed to an officer on first taking up his appointment, but in the case of subsequent transfers (if any) removal expenses will be allowed in accordance with the scale fixed by departmental regulations. When required to travel on the public service officers will be allowed first-class railway fares and other approved travelling expenses. When absent from headquarters they will be paid subsistence allowance, in accordance with Departmental Regulations, on the following scale:—In case of absence not exceeding 14 nights in any one place, £1 for each night of absence. In case of absence exceeding 14 nights in any one place, 13*s.* 4*d.* for each night of absence. In case of absence exceeding 10 hours in any one day which is not covered by a night allowance, 6*s.* 8*d.* for that day. Subject to the state of public business permitting, officers will be allowed holidays of 36 week-days during each of their first ten years of service, and 48 week-days thereafter, exclusive of the ordinary public holidays. The appointments will be subject to the usual probation of two years applying generally in the Civil Service.

4. *Retirement.*

No age limit for retirement has yet been fixed by the Commissioners, but officers may be called upon, and have a right, to retire at any time after attaining the age of 60. Retirement is in any case compulsory at the age of 65. Officers on retirement will be qualified for awards in accordance with the Superannuation Acts, 1834–1909, the main provisions of which may be summarised as follows:—(*a*) *Pensions on retirement.*—Officers who have reached the retiring age or are invalided at an earlier age may, if they have completed 10 years' service, be granted a superannuation allowance on retirement equivalent to 1/80th in the case of men and 1/60th in the case of women of their annual salary on retirement, for each year of approved service. If they have not served for 10 years they can receive no pension, but may be granted a gratuity not exceeding one month's pay for each year of approved service. (*b*) *Additional lump-sum allowance on retirement (applicable to men only).*—In addition to any pension or gratuity paid as in (*a*) above, male officers who retire after having served for not less than two years may be granted a lump-sum allowance equal to 1/30th of the annual salary on retirement, multiplied by the number of completed years of approved service. (*c*) *Gratuity in case of death of male officers.*—In the case of the death of a male officer, whilst still employed in the service, after he has served for five years or upwards, a gratuity equal to his annual salary at death may be granted to his legal personal representatives. (*d*) *Gratuity in case of marriage*

of women officers.—Women officers are required to resign their appointments on marriage, and those retiring in such circumstances after not less than six years' approved service may, at the discretion of the head of the department, and with the approval of the Treasury, receive a gratuity at the rate of one month's pay for each complete year of established service, but not exceeding in the whole a maximum of 12 months' pay. No deduction is made from salaries in respect of the above privileges. In certain circumstances the above awards are calculated not on the actual salary at the time of retirement or death, but on the average salary for the three preceding years. Officers voluntarily resigning before attaining the age of 60 can receive no pension or retiring allowance of any kind, except in the case of women on marriage as set out in (*d*) above.

The particulars have been printed in full in order to show practitioners that the scope of service is purely administrative, and that there is no suggestion that the selected medical officers should be used to reinforce panels where necessary.

MEDICAL BENEFIT FOR MIGRATING MEMBERS.

Special arrangements have now been made for the provision of medical benefit in the case of insured persons who constantly move from place to place over a wide area in the course of their employment. Such persons if they prove that the circumstances of their employment are such as to render these special arrangements applicable will be supplied with a special yellow voucher which will be available in the area of any Insurance Committee in Great Britain. A form for use in applying for permission to be admitted to these special arrangements may be obtained from any Insurance Committee or from the secretary, National Health Insurance Commission (England), Buckingham Gate, London, S.W.

DRUNKENNESS AND MEDICAL BENEFIT UNDER THE ACT.

The Halifax National Health Insurance Committee appears to have had propounded to it by the chief constable of Halifax the question whether an insured person arrested upon a charge involving that of drunkenness would be entitled to call in "his panel doctor" without payment to examine him with regard to his alleged condition. The reply directed to be sent by the clerk to the Committee was in the affirmative, but subject to the following conditions—(1) that the medical man should be sent for at the request of the insured person or of some responsible relative; (2) that the attendance asked for should not involve a journey outside the insurance area in which the insured person resides; (3) that every reasonable precaution should be taken to notify the medical man as early as possible; (4) that such service by the panel doctor should not include the giving of his opinion to any but the insured person or his relative, nor the giving of a certificate stating whether the insured person was drunk or not, nor the attendance at court of the medical man without fee. The question raised is certainly one of importance to medical practitioners serving on panels, and it probably was not considered by those responsible for the passing of the National Insurance Act. Section 15, Subsection 2, for example, enables regulations to be made by the Insurance Commissioners providing for arrangements "such as to secure that insured persons shall receive adequate medical attendance and treatment from the medical practitioners with whom arrangements are made," and the phrase "medical attendance and treatment" appears to be intended in the Act to cover the "medical benefit" to which the insured person is entitled. Admittedly persons arrested for offences involving the charge of drunkenness include some in whose cases genuine illness has been mistaken by the police for the effects of alcoholic indulgence, and no one denies that a medical opinion on such an occasion is a safeguard for the obtaining of which every reasonable facility should be afforded. Even, however, in such a case we submit that, if the right to summon the "panel doctor" is to be given, a special fee should be provided for what is likely to be an exceptional occasion, and the matter should not be treated as coming into the ordinary routine of panel work. More usually, however, a man who has created a disturbance, or otherwise attracted the notice of the police, is arrested and charged with having been guilty of the offence, whatever it may be, while under the influence of drink, and without claiming to be ill he denies the drunkenness, alleging that though possibly excited he was not drunk, or giving some other excuse or reason for his conduct. As a rule, in circumstances prevailing before the Insurance Act, a person charged who insisted upon a medical man being summoned belonged to the class more or less accustomed to pay for medical attendance; and he might be desirous either of preventing, if possible, a convivial evening from ending in a morning a a police-court, or of minimising the result of such an appearance. Even though all allowance is made for the conditions which the Halifax Insurance Committee would impose, it seems to us that the effect of recognising attendance at a police-station to examine an insured person charged with drunkenness as a part of the "medical attendance and treatment" to be supplied under the Insurauce Act would be to impose an intolerable burden upon many of the medical men upon panels, and one which the Act did not intend should be imposed. As has been suggested, persons able to pay and anxious to contest the question of intoxication have hitherto done so upon a limited number of occasions. There would, however, be no limit to such occasions if every "drunk and disorderly" knew that he was entitled to send for his "panel doctor" (which he would always be ready to do, if only to give the police more trouble), and to take his chance of being able to persuade that gentleman that the police had held an exaggerated view of the responsibility of alcohol for his situation. He might not, indeed, be able to demand a certificate or evidence to be given in his defence without paying a fee, but the knowledge of this, if it could be conveyed to him, would not prevent him from insisting on his "rights." If the man was drunk the medical practitioner would have been called out for nothing, and this would happen in the majority of cases. If the man was sober he would certainly feel it a hardship that his insurance should go half way in providing him with a witness and then stop; but to provide witnesses upon such occasions certainly is not one of the duties imposed upon Insurance Committees by the Act. There the Halifax Insurance Committee would appear to be upon safe ground.

Correspondence.

"Audi alteram partem."

DANGERS OF ARTIFICIAL PNEUMOTHORAX.

To the Editor of THE LANCET.

SIR,—May I, as one who has learnt much from demonstrations by Dr. Claude Lillingston of this, relatively, altogether exceptionally effective special treatment of consumption, and who appreciates his close acquaintance with the literature (especially the Scandinavian part of it—a stumbling block to one of us), make a few remarks on his paper in THE LANCET of Sept. 13th. The inclusion of aspiration pneumonia seems to show a purview embracing more of the dangers involved than those exclusively concerned with sudden death. Perhaps for completeness' sake acute empyema might have been added, since Elving [1] says that in several cavity cases attempts to break down adhesions by means of artificial pneumothorax have resulted in rupture of the cavity wall and production of an empyema. Very likely this would be by exceeding safe limits of positive pressure (20 cm. H_2O), where only partial pneumothorax was obtainable, at any rate to begin with. Certainly, although treating (among others) a case of just this nature weekly for the last six months, I have seen no casualty at all; and I agree that, generally speaking, dangers are easily avoidable by attention to a proper technique. In fact, the impression present with me is that all *special* treatments of consumption may be ranged in three classes. The first comprises the "remedies" that have been coming and going every few months since time immemorial—radio-menthol iodine, Kuhn's mask, succinimide of mercury, inhalations, intravenous injection of antiseptics, maggots, hypophosphites, snails, and so on; the second is intensive tuberculinisation, at any rate a heuristic thing; and the third, lung collapse. It should be added that in nine years' special experience I have never been similarly enthusiastic before.

[1] Ergebnisse der inneren Medizin und Kinderheilkunde, Band x., S. 927.

Letters on previous papers have a way of illustrating the principle of the passage of the homogeneous into the heterogeneous; and perhaps, if the discursiveness be not too wide, no harm either. The fresh point desired to be made is this. Here is a treatment which, although no doubt relapses can be cited, is pretty certainly an advance. An advance because, *a priori*, surgery when it makes an incursion into medical therapeusis has a knack of coming to stay; and because, *a posteriori*, besides the facts of the establishment of a special journal and of an international society, people who are baffled (in about one-fifth of the trials they make) in inducing pneumothorax, do not proceed to undertake, on folk already seriously ill, measures like phrenicotomy and like extensive rib-cutting, unless heart-convinced that there is everything to be gained by only getting the lung compressed, or at least non-functioning. It does not want much critical faculty to recognise that. No, the treatment is good. Its great defect is that it has such small scope; at present but 5 per cent. of all cases are deemed suitable. This is because, so far, one of the indications required is that of failure with ordinary measures, that of general severity, of something approaching desperation. For there are many more than 1 in 20 of sanatorium cases showing a fair amount of unilaterality, even allowing for Forlanini's warning that the "good" lung must not be too favourably assessed. Seeing, then, that subsequent relapse is the reproach of sanatorium treatment, it might be well, now that the technique of "close" pneumothorax therapy is so safe, to try it early, and in every not otherwise contra-indicated case showing a suitable anatomical distribution of the disease. The tuberculosis officer could keep up the "refills" after discharge, just as he goes on with tuberculin injections after discharge; while in his institution for advanced cases he would find another incentive to familiarising himself with the treatment, because there he might from time to time accomplish some astonishing revivifications.

I am, Sir, yours faithfully,

W. C. RIVERS.

Northumberland Sanatorium, Barrasford, Sept. 13th, 1913.

PIGNET'S FACTOR OF PHYSICAL FITNESS.

To the Editor of THE LANCET.

SIR,—As I am an old and constant subscriber to THE LANCET, will you oblige me, and doubtless many others, by inserting a description of Pignet's formula for estimating the efficiency of recruits. I have many books on hygiene, but cannot find it anywhere, and it is not in Burroughs and Wellcome's "Diary." It is alluded to in THE LANCET of March 22nd, 1913 (p. 858) as Pignet's factor.

I am, Sir, yours faithfully,

W. H. SYMES, M.D.

Christchurch, New Zealand, July 24th, 1913.

*** As an index of physical fitness the French military surgeon Pignet devised the following formula: $F = H - (C + W)$: in which H = height in centimetres; C = minimum chest measurement in extreme expiration, in centimetres; W = weight in kilogrammes, and F is taken as a factor, or expression, of physical fitness. The larger the excess of height over the sum of the chest measurement and the weight, expressed in the terms just stated, the poorer the physique of the subject. If this excess (F) amount to 25 or upwards, Pignet classes the subject as "weak"; if F does not exceed 20, the subject is of "good" physical development; if from 10 to 15, he is considered "strong"; and if less than 10, "very strong." Similarly, if it is 30 to 35, he is "very weak," and if over 35 a recruit is considered to be useless for military service. Colonel R. H. Firth, R.A.M.C., has been recently applying this formula for estimating efficiency to various races from which are drawn recruits for our Indian army. Amongst these the Hazarns, Garhwalis, and Gurkhas give respectively 62, 51, and 44 per cent. with factors of less than 20—i.e., "good," "strong," and "very strong"; the Hindus and Musalmans of Rajputana, the Dekhanis, and the Hindustani Hindus and Musalmans gave respectively 77, 76, and 70 per cent. with factors of 25 or more—i.e., "weak," "very weak," or "useless." The results obtained by the use of this factor appear to corroborate the opinions generally held as to the fitness for military service of these respective races. The short, sturdy type of man gives the lowest range and the tall, lean man a correspondingly high factor. Anyone may work this out for himself and see how far he conforms to the theoretical standard of physical efficiency.—ED. L.

Obituary.

FRANK BUSZARD, M.D. LOND., F.R.C.P. LOND., F.R.C.S. ENG.,

SENIOR PHYSICIAN (LATE SENIOR SURGEON), NORTHAMPTON GENERAL HOSPITAL.

THE death of Dr. Frank Buszard took place on Sept. 14th at Dallington, Northampton, at the age of 74. Dr. Buszard was the younger son of Dr. Marston Buszard, of Lutterworth, Leicestershire, his elder brother being the present Recorder of Leicester, Mr. Marston Buszard, K.C. He received his medical education at Guy's Hospital, qualifying as M.R.C.S. in 1860. In 1861 he took the L.S.A., and in the same year the M.B. Lond., proceeding to the M.D. degree in 1865. In 1862 he became a Licentiate of the Royal College of Physicians, a Member thereof in 1877, and in 1887 he was elected a Fellow. He became a Fellow of the Royal College of Surgeons in 1864. After a period of service as house surgeon at Guy's Hospital he went to Northampton as house surgeon to the General Hospital, with which he remained connected up to the time of his death—a period of over 50 years. Hospital conditions in those days were in a very primitive state, and Dr. Buszard became a pioneer in hospital reform. He brought about great improvements in the Northampton General Hospital, and was also a staunch advocate of hospital reform at the various medical meetings he attended. On the visiting staff of the hospital he served first on the surgical side and subsequently on the medical. In March, 1912, his services to the hospital were recognised by the presentation to him of his portrait in oils. Dr. Buszard was a borough magistrate for Northampton and for many years the leader of the Unionist Party there. He leaves a widow, two daughters, and one son.

GEORGE JOHNSTONE BUCHANAN, M.B., C.M. ABERD.,

MAJOR ROYAL ARMY MEDICAL CORPS.

MANY friends in India and at home will hear with deep regret of the death of Major George Johnstone Buchanan, aged 48 years, which took place in London on August 22nd, the result of a gunshot accident. Major Buchanan was educated at Aberdeen University, qualifying in 1888. He entered the Royal Army Medical Corps on Jan. 30th, 1892, being promoted to the rank of captain in 1895 and to that of major in 1904. Out of his 21½ years' service in the army, he spent 17½ years in India, his first Indian station being Lucknow in 1893, afterwards Cawnpore, where he held the appointment of staff-surgeon for some time, and from there he went on active service on the North-West Frontier (Tirah campaign), for which he received the medal and clasp (Punjab Frontier, 1897-8). On his second tour he went to Dum Dum, and from there to manœuvres, the Delhi Durbar of 1903, and then Bareilly. In his third tour of foreign service he was stationed at Bareilly again for a short time, then Chaubuttia, and from there he went to Agra, where he held charge of the station hospital for over a year. Recently he had been selected by the Director-General of the Army Medical Service for appointment as medical inspector of recruits in the Eastern Command.

A brother officer writes:—"Whoever had the pleasure of meeting Major Buchanan found him one of the kindest of men. His advent at a club gathering or a regimental mess always brought a sense of good cheer and a smile to most faces, for everyone liked him. He never had a word of unkindness or uncharitableness for anyone, and was essentially a man's man amongst men. As to qualifications, his outstanding feature was his wonderful knowledge of Indian dialects. He not only had passed the higher proficiency test in Urdu, but was appointed an examiner

afterwards in this language by the Government of India. He also qualified in Punjabi, Hindu, and Persian by the lower standard test. His knowledge of the Indian language stood him in good stead with natives, and he held the cantonment surgeoncy for five years consecutively at Bareilly where he acquired considerable renown amongst the natives, having not only the '*baht*' but also the gestures of hand and eye which are essentially native, and it used to be said that he could have traversed India in disguise if necessity arose. He held the confidence of the natives to quite an extraordinary extent, and could get at their real feelings and views as few others could. To his widow the deepest sympathy of Major Buchanan's brother officers goes out in her hour of trial, for he nobly upheld in every way the motto of his corps, 'In Arduis Fidelis.'"

TEMPEST ANDERSON, M.D., B.Sc. LOND., M.R.C.S. ENG., L.S.A., HON. D.SC. LEEDS,

CONSULTING OPHTHALMIC SURGEON TO YORK COUNTY HOSPITAL, AND CONSULTING PHYSICIAN TO YORK LUNATIC ASYLUM.

Dr. Tempest Anderson died recently from typhoid fever on his return voyage from the Philippine Islands. He had long retired from practice as an ophthalmic surgeon, in which field he had attained some eminence, and devoted himself to scientific work. Dr. Anderson was born at York in 1846, and was the eldest son of the late Mr. William C. Anderson, M.R.C.S., J.P., of that city. He received his early education at St. Peter's School, York, and University College, London, and took the B.Sc. of London University in 1867. His medical education also was obtained at University College, where he gained two exhibitions in 1864, one in 1866, and a scholarship in zoology in 1867. He qualified as L.S.A. in 1867, and became M.R.C.S. in 1868. In the latter year he took the M.B., B.S. Lond., proceeding to the M.D. degree there in 1873. After studying at Paris, Vienna, Munich, and Berlin he returned to his native city, where he joined his father in practice, and became ophthalmic surgeon to the York County Hospital, of which he was consulting ophthalmic surgeon at the time of his death. He retired from active practice about 1905 and devoted himself entirely to the scientific work which had already engaged so large a portion of his attention. The University of Leeds had already conferred on him its honorary D.Sc. in 1904. His scientific work was mainly in the field of seismology. He was Tyndall lecturer at the Royal Institution, choosing the subject of Volcanoes. Besides several papers on ophthalmological subjects in THE LANCET and other medical journals, and the invention of certain ophthalmological instruments, he published a volume of "Volcanic Studies" in 1902. He was a joint author of the Report to the Royal Society on West Indian Volcanic Eruptions, 1902 and 1907. His scientific affiliations brought him into touch with numerous scientific societies. He was a Fellow and member of council of the Geological, the Royal Geographical, and the Linnaean Societies, and an honorary member of some foreign societies, also a Fellow of University College. He was a member of the council and a former Vice-President of the British Association, and President of the York Philosophical Society and the York Medical Society. He had travelled extensively and was an expert photographer.

His social activities included an interest in the housing question and the preservation of open spaces. He served as sheriff of York in 1894 and was a borough magistrate. Dr. Anderson was unmarried.

JOHN BROADBENT, M.R.C.S. ENG., L.S.A.

THE death is announced of Mr. John Broadbent at the advanced age of 81. He was born in the West Riding of Yorkshire, and apprenticed at Dobcross, near Saddleworth, becoming in due course a student at the old Manchester School of Medicine, under Southam, Turner, and other well-known men. He qualified in 1857, and after a short time spent in the neighbourhood of Liverpool he became resident medical officer in sole charge of the old workhouse where the Victoria Station, Manchester, now stands. There were at that time no visiting medical officers, and the young resident had to depend for help in major operations on friends in practice in the neighbourhood, while the dispenser acted as anæsthetist, and there were no nurses worthy of the name. Mr. Broadbent's results showed how much could be done under conditions which would now be considered appalling. On leaving this appointment he became district medical officer for Ancoats, and held that position through the dark days of the cotton famine. A severe attack of enteric fever laid the foundation of the ill-health from which he suffered in later years, and in 1876 he removed to the neighbourhood of Alexandra Park, where he continued to practise until an empyema necessitated his retirement in 1887.

Mr. Broadbent was a well-known member of the Manchester Medical Society, and in years gone by was an enthusiastic worker with the microscope, whilst he had been secretary and President of the Medico-Ethical Society. He was a member of several other medical societies, and retained his interest in them to the last.

A skilful and careful practitioner, of a gentle and kindly disposition, and the very soul of professional honour, Mr. Broadbent was held in high esteem by those who were privileged with his friendship. His remains were interred at the Manchester Southern cemetery on Sept. 8th.

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following eminent foreign medical men are announced:—Dr. Julio Jolly, assistant physician to the Children's Hospital and the Hospital San Roque, Buenos Aires, aged 28.—Dr. J. H. Koch, senior medical officer, Augustus te Weltevreden, Java.—Dr. Darricarrère, formerly inspecting medical officer of the French Military Medical Service.—Dr. H. Tenneson, formerly on the staff of the Paris hospitals.—Dr. K. Bürkner, extraordinary professor of laryngology in the University of Göttingen and sanitary Privy Councillor, aged 60. He published an Atlas of Otoscopy and a Manual of Aural Surgery.—Dr. Ricken, of Arnsberg, sanitary councillor.—Dr. Chr. Wildfang, of Hagen, sanitary councillor.

Medical News.

FOREIGN UNIVERSITY INTELLIGENCE.—*Clausenberg* (*Kolozsvar*): Dr. Jakabházy, *privat-docent*, has been promoted to the chair of Physiology.—*Göttingen*: Dr. O. Löb, *privat-docent* of Pharmacology, has been granted the title of Professor.—*Kiel*: Dr. Wieland has been recognised as *privat-docent* of Medicine and Dr. O. Meyerhof as *privat-docent* of Physiology.—*Leipsic*: Dr. Ernst von Brücke, *privat-docent* of physiology, has been promoted to Extraordinary Professor.—*Lemberg*: Dr. Witold Nowicki, *privat-docent* of pathological anatomy, has been promoted to Extraordinary Professor.—*Naples*: Dr. Domenico Pane, of Pavia, has been recognised as *privat-docent* of Bacteriology.—*Pavia*: Dr. Mario Ciovini has been recognised as *privat-docent* of Internal Pathology.—*Prague* (*German University*): Dr. Hugo Wiener has been granted the title of Extraordinary Professor. (*Bohemian University*): Dr. Ottokar Frankenberger, extraordinary professor of laryngology and otology, has been granted the rank and title of Ordinary Professor.—*Rome*: Dr. Ricardo Lolli has been recognised as *privat-docent* of Medical Pathology.—*Rostock*: Dr. M. Riemer, *privat-docent* of hygiene, has been granted the title of Professor.—*Saarbrücken*: Dr. Händel, of the Berlin Health Department, has been appointed Director of the Infectious Diseases Hospital, in succession to Dr. Lentz.—*Tübingen*: Dr. Dibbelt, *privat-docent* of pathological anatomy, and Dr. Brodman, *privat-docent* of neurology and psychiatry, have been granted the title of Extraordinary Professor.—*Vienna*: Dr. Josef Schaffer, professor in Gratz, has been appointed to the Chair of Histology, in succession to Dr. von Ebner, who is retiring; and Dr. H. Finsterer has been recognised as *privat-docent* of Surgery.

SANITARY CONFERENCE AT LLANDUDNO.—In recent years the annual meetings of the Association of Sanitary Inspectors have had an interest which might not otherwise have been attached to them from the delivery by the president of the association, Sir James Crichton-Browne, of a characteristically original address. The meeting held at Llandudno from Sept. 9th to 12th was no exception. Amongst other matters the President referred to the dangers of road dust which had been accentuated by the increasing amount

of road traffic, and especially of motors. There was no doubt, he said, that pathogenic spores and bacilli which were resistant to drying might be carried about by dust, and the ensuing danger seemed to be enhanced if associated with it were chemically corrosive or mechanically wounding elements. He referred to the special risk of contracting tetanus from the wafting about of horse manure on the roads, and suggested that narrow and ill-made roads should be gradually abolished and that houses should be built at a short distance from the edge of the roads. One of the most instructive discussions at the conference was that upon milk-supplies, which was opened by Dr. E. R. Woodhouse, of Llandudno, who maintained that the cleanliness of the surgical operating theatre was the ideal cleanliness to be aimed at in the dairy and throughout the career of milk from the cow to the consumer. A strict Milk Bill was wanted altering the method of inspection. Dairymen and vendors should be licensed, and competent inspectors should be appointed to inspect the cows, byres, premises, utensils, and all those who work in connexion with the milk trade. Milk-churns should be so constructed to prevent anything gaining access to the milk during its transit or distribution. Dr. Woodhouse stated that the Birmingham convalescent homes at Llandudno were supplied with milk from their own herds of cows. Each of the cows was tested for tuberculosis, and wore a metal disc on its ear as a certificate of freedom from the disease. In the course of discussion the difficulty of dealing effectually with typhoid carriers was referred to, and it was suggested that no person who had had an attack of the disease should be employed in the preparation of food.

DONATIONS AND BEQUESTS.—Mrs. Isabella Riddle Glover, who has bequeathed to the University of Edinburgh the sum of £4000 for the creation of two annual scholarships, to be called "The Principal Caird Scholarships," in either classics or philosophy, has also left by will £1000 to the Western Infirmary, Glasgow.—The Leicester Infirmary will receive under the will of the late Mr. Walter B. Clark £500.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.—The first meeting of the session was held on Sept. 4th at the Dispensary, Brighton, Dr. Walter Broadbent, the President, being in the chair. After welcoming Dr. Broadbent to the Presidential chair Dr. H. H. Taylor showed a case of Arterio sclerosis of the Retinal Vessels. He referred to the marked "white-star" appearance in the left eye, with compression of veins by the hardened arteries and a large hæmorrhage in the right eye, and emphasised the local nature of this condition, attended with no general high blood pressure and no kidney disease, being due probably to selective action of some toxin circulating in the blood. Consequently the prognosis in these cases was much better than would have been admitted some years ago, when the condition would have been attributed undoubtedly as secondary to renal disease.—Dr. C. F. Bailey showed an interesting series of Skiagrams illustrating the "holding up" of a bismuth meal in a patient who had suffered from abdominal pain for years and been operated on eight years ago with no permanent benefit. The photographs showed a shadow pool in the lower part of the stomach and a large shadow in the right flank in the transverse colon 27 hours after meal and absence of any bismuth in the rectum or descending colon as long as 51 hours after.—The President discussed the case and suggested that adhesions, possibly the result of original gastric ulcer, produced a bend or kink in the region of the splenic flexure.—The President read an address on Disorders of the Stomach and their Remote Effects. He said that there were two conditions of the stomach which gave rise to the greatest number of remote effects. The first was when the percussion note over the stomach was abnormally tympanitic and the resonance as high as the fifth rib, extending out towards the axillary region. The stomach was blown out by retained gas and food, which was not allowed to pass the pylorus, while the muscles of the wall were in a state of strain or spasm. There was an excess of acid in the contents, hydrochloric or lactic, which kept the pylorus shut. The stomach was supplied by the vagus, and other organs supplied by this nerve suffered reflex effects. Attacks of asthma were often brought on by this condition of stomach and the so-called stomach cough. The heart was frequently affected reflexly, and also by pressure on the right auricle and ventricle, which lie on the diaphragm just above the stomach. Palpitation in many cases was due to this flatulent distension. In paroxysmal tachycardia the attacks of rapid heart beat were often caused by it. Intermittency and irregularity of the pulse, giddiness and fainting, and even sudden death were liable to occur from this disorder of the stomach, when the heart wall was weakened by degeneration or myocarditis. In pneumonia and other fevers high gastric resonance was a danger. Pseudo angina pectoris was nearly always due to stomach disorder, and attacks of true angina might be brought on by it in those with diseased coronary vessels. Marked vertigo may occur, when the head swims but objects do not appear to rotate or the floor to rock, as in cerebral vertigo. The second condition of stomach giving rise to remote effects was the dilated stomach. When the patient was recumbent a splash could be obtained by succussion down to or below the umbilical level. The stomach wall was atonic and the gastric juice deficient in acid, allowing fermentation to take place and ptomaines to be formed. There was no spasm of the pylorus, since, on raising the hips on pillows, to put the stomach above the level of the pylorus, fluid could be at once heard gurgling out of the stomach. The most frequent effect of this condition was depression of spirits, sometimes amounting almost to melancholia. Sleeplessness was another result, the most characteristic being when the patient got to sleep, but awoke at 2 A.M. or 3, and was unable to go to sleep again. He concluded with some remarks on treatment.—Dr. R. J. Ryle, Dr. Bailey, Dr. S. B. Figgis, Dr. Alexander Morrison, Dr. Donald G. Hall, and Mr. H. N. Fletcher took part in subsequent discussion.—A hearty vote of thanks was passed to Mr. George Morgan for a series of micro-photographs presented by him to the society.

THE DEATH OF DR. LOUIS MERCK.—It is with great regret that we have to announce the decease on Sept. 14th of Geheimrat Dr. Louis Merck, of Darmstadt. He has for a number of years been head of the firm of E. Merck, chemical works, Darmstadt, and his loss will be keenly felt by all who had either personal or business relations with him.

BOOKS, ETC., RECEIVED.

ASH (CLAUDIUS), SONS, AND CO., LIMITED, Broad-street, Golden-square, London, W.

John Hunter and Odontology. By J. F. Colyer, L.R.C.P., M.R.C.S., L.D.S., Dental Surgeon to the Royal Dental Hospital of London and to the Charing Cross Hospital; Examiner in Dental Surgery, Royal College of Surgeons of England; Hon. Curator, Odontological Collection of the Museum of the Royal College of Surgeons of England. Price 20s. net.

BOMBAY NATURAL HISTORY SOCIETY, Bombay. DULAU AND CO., 37, Soho-square, London, W.

The Poisonous Terrestrial Snakes of our British Indian Dominions (including Ceylon) and how to Recognise Them. With Symptoms of Snake Poisoning and Treatment. By Major F. Wall, I.M.S., C.M.Z.S. Third edition, fourth thousand. Price Rs.3.

F. M. S. GOVERNMENT PRINTING OFFICES, Kuala Lumpur.

Short Key to the Identification of the Anopheline Mosquitoes of Malaya. For the Use of Medical Officers and Others. By C. Strickland, M.A., M.B. Cantab., Travelling Medical Entomologist, F.M.S., late Assistant to the Quick Professor in the University of Cambridge. Price not stated.

HERRICK BOOK AND STATIONERY COMPANY, Denver, Colorado.

The Ophthalmic Year Book. Volume IX. Combining a Digest of the Literature of Ophthalmology for the Years 1911 and 1912. Edited by Edward Jackson, M.D., Professor of Ophthalmology in the University of Colorado, with assistance. Price not stated.

IMPRIMERIE DE LA SOCIÉTÉ ANONYME FRANKLIN, Budapest.

L'Enseignement de la Médecine et l'Enseignement Médical Complémentaire en Hongrie. Rapport présenté à la Conférence Internationale de Londres (Août, 1913). Par le Prof. Dr. Emile de Grosz, Budapest. Price not stated.

JORDAN AND SONS, LIMITED, 116 and 117, Chancery-lane, London, W.C.

The Law of Domestic Servants, with a Chapter on the National Insurance Act, 1911. By J. D. Casswell, B.A., of the Middle Temple and the Western Circuit, Barrister-at-Law. Price 1s. 6d. net.

KABITZSCH, CURT, Würzburg.

Die Untersuchung der Luftwege. Ein Vortrag zur Einführung in die moderne Rhino-Laryngologie für Aerzte und Studierende. Von Dr. P. H. Gerber, a.o. Professor und Direktor der Königlichen Universitätspoliklinik für Hals- und Nasenkranke zu Königsberg i.Pr. Price M.2.

KIMPTON, HENRY, London. STENHOUSE, ALEXANDER, Glasgow.

Vaccine and Serum Therapy. Including also a Study of Infections, Theories of Immunity, Specific Diagnosis and Chemotherapy. By Edwin Henry Schorer, B.S., M.D., Dr.P.H. Second revised edition. Price 12s. 6d. net.

Genitourinary Diagnosis and Therapy. For Urologists and General Practitioners. By Doctor Ernst Portner, Specialist for Urology, Berlin, Germany. Translated and edited by Bransford Lewis, M.D., B.Sc., Professor of Genitourinary Surgery, Medical Department of St. Louis University, St. Louis. Price 10s. 6d. net.

KING, P. S., AND SON, Orchard House, Westminster, London, S.W.

The Deaf. Handbook containing Information relating to Statistics and Schools, Missions, Hospitals, Charities, and other Institutions for the Deaf. Compiled by the National Bureau for Promoting the General Welfare of the Deaf, 104, High Holborn, London, W.C. Price 6d. net.

MACMILLAN AND CO., LIMITED, London.

The Nervous and Chemical Regulators of Metabolism. Lectures By D. Noël Paton, M.D., B.Sc., Professor of Physiology in the University of Glasgow. Price 6s. net.

MARHOLD, CARL, Halle a.S.

Sammlung zwangloser Abhandlungen aus dem Gebiete der Dermatologie, der Syphilidologie und der Krankheiten des Urogenitalapparates. Herausgegeben von Professor Dr. J. Jadassohn in Bern.

II. Band, Heft 2. Diagnose und Therapie der syphilogenen Erkrankungen des Zentralnervensystems. Von Dr. M. Nonne, Oberarzt am allgemeinen Krankenhaus Hamburg-Eppendorf. Price M.1.50.

II. Band, Heft 3. Ueber Kinderekzeme. Von Prof. Dr. V. Klingmüller in Kiel. Price M.1.

II. Band, Heft 4/5. Die allgemein-pathologische Bedeutung der Dermatomykosen. Von Prof. Bruno Bloch, Basel. Price M.3.

II. Band, Heft 6. Die Geschlechtskrankheiten und die ärztliche Verantwortlichkeit. Von Dr. Gerhard Hahn, Breslau. Price M.1.

II. Band, Heft 7. Ueber Cystitis. Von Privatdozent Dr. R. Hottinger, Zürich. Price M.1.

Sammlung zwangloser Abhandlungen aus dem Gebiete der Verdauungs und Stoffwechsel-Krankheiten. Herausgegeben von Dr. A. Albu in Berlin.

IV. Band, Heft 7. Der Magensaftfluss und verwandte Sekretionsstörungen. Von Sanitätsrat Dr. A. Günzburg, Frankfurt a.M. Price M.2.

IV. Band, Heft 8. Zur Pathogenese, Klinik und Therapie der erworbenen Mastdarmstrikturen. Von Dr. Ernst Ruge, Frankfurt-Oder. Price M.1.50.

V. Band, Heft 1. Die Röntgendiagnostik der Darmkrankheiten. Von Dr. M. Faulhaber, Privatdozent an der Universität Würzburg. Price M.1.50.

SAUNDERS (W. B.), COMPANY, London and Philadelphia.

The Elements of Bacteriological Technique. A Laboratory Guide for Medical, Dental, and Technical Students. By J. W. H. Eyre, M.D., M.S., F.R.S. Edin., Director of the Bacteriological Department of Guy's Hospital, London, and Lecturer on Bacteriology in the Medical and Dental Schools. Second edition, rewritten and enlarged. Price 13s. net.

The Operating Room and the Patient. A Manual of Pre- and Postoperative Treatment. By Russell S. Fowler, M.D., Chief Surgeon, First Division, German Hospital. Third edition, rewritten and enlarged. Price, cloth, 15s. net.

Massage, its Principles and Technic. By Max Böhm, M.D., Berlin, Germany. Edited, with an Introduction, by Charles F. Painter, M.D., Professor of Orthopedic Surgery at Tufts College Medical School, Boston. Price, cloth, 7s. 6d. net.

Gonorrhea in Women. By Charles C. Norris, M.D., Instructor in Gynecology, University of Pennsylvania. With an Introduction by John G. Clark, M.D., Professor of Gynecology, University of Pennsylvania. Price, cloth, 25s. net.

Collected Papers by the Staff of St. Mary's Hospital Mayo Clinic, Rochester, Minnesota. 1912. Price, cloth, 24s. net.

Diet in Health and Disease. By Julius Friedenwald, M.D., Professor of Gastro-enterology in the College of Physicians and Surgeons, Baltimore, and John Ruhräh, M.D., Professor of Diseases of Children in the College of Physicians and Surgeons, Baltimore. Fourth edition, thoroughly revised and enlarged. Price, cloth, 18s. net.

Obstetrics for Nurses. By Joseph B. De Lee, A.M., M.D., Professor of Obstetrics, Northwestern University Medical School. Fourth edition, thoroughly revised. Price, cloth, 12s. net.

A Laboratory Manual of Invertebrate Zoology. By Gilman A. Drew, Ph.D., Assistant Director of the Marine Biological Laboratory, Woods Hole, Massachusetts. Second edition, revised. Price, cloth, 6s. net.

A Clinical Manual of Mental Diseases. By Francis X. Dercum, M.D., Ph.D., Professor of Nervous and Mental Diseases, Jefferson Medical College, Philadelphia. Price, cloth, 13s. net.

URBAN UND SCHWARZENBERG, Berlin und Wien.

Spezielle Pathologie und Therapie innerer Krankheiten. In 10 Bänden. Herausgegeben von Friedrich Kraus und Theodor Brugsch in Berlin. Lieferung 9-12. Price M.8. (Preis jeder Lieferung M.2, or K.2.40.)

VOGEL, F. C. W., Leipzig.

Grundrias der Pharmakologie in Bezug auf Arzneimittellehre und Toxikologie. Von O. Schmiedeberg, Ord. Prof. der Pharmakologie und Direktor des Pharmakologischen Instituts an der Kaiser-Wilhelms-Universität Strassburg. 7 Auflage. Bearbeitet unter Mitwirkung von E. St. Faust, Ord. Prof. der Pharmakologie und Direktor des Pharmakologischen Instituts an der Universität Würzburg. Price, paper, M.12; bound, M.13.40.

Ueber die Stellung der Geschwülste unter den Naturerscheinungen. Von Prof. Dr. F. de Quervain, Direktor der Chirurg. Universitäts-Klinik in Basel. Vortrag gehalten in der Naturforschenden Gesellschaft in Basel am 19. Februar, 1913. Price M.1.50.

Der Ursprung der Syphilis. Vortrag gehalten auf dem Internationalen medizinischen Kongress zu London am 7. August, 1913. Von Karl Sudhoff. Price M.1.50

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

ANGUS, JAMES, M.B., Ch.B., has been appointed Outdoor Surgeon to the Glasgow Maternity and Women's Hospital.

BURKE, M., M.B., B.Ch. R.U.I., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Skibbereen District of the county of Cork.

CHALLENOR, LIONEL, M.R.C.S., L.R.C.P. Lond., has been appointed First House Surgeon at the Leicester Royal Infirmary.

CHARLES, S. F. A., M.D., B.Ch. Dub., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Lisbellaw District of the county of Fermanagh.

GARVIN, S., M.B., B.Ch. Edin., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Clonavaddy District of the county of Tyrone.

MACNAUGHT, W. W., M.B., B.Ch. Glasg., has been appointed Indoor House Surgeon at the Glasgow Maternity and Women's Hospital.

MURDOCH, JOHN, M.B., Ch.B. Glasg., F.R.C.S. Edin., has been appointed one of the Medical Referees under the Workmen's Compensation Act, 1906, for the Sheriffdom of Fife and Kinross, to be attached more particularly to the Dunfermline with Kinross District.

REID, D. W., L.R.C.P. & S. Edin., L.F.P.S. Glasg., has been appointed Outdoor Surgeon to the Glasgow Maternity and Women's Hospital.

RITCHIE, T. C., M.B., B.Ch. Edin., has been appointed Indoor House Surgeon at the Glasgow Maternity and Women's Hospital.

SHARPE, C. G. HAYE, M.B., Ch.B. Leeds, has been appointed Ophthalmic Surgeon to the Luton Education Committee.

WADE, B. W., M.D., B.Ch. Dub., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Harleston District of the county of Norfolk.

WILKINSON, S. H., M.B., Ch.B. Edin., has been appointed Second House Surgeon at the Leicester Royal Infirmary.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

AYR DISTRICT ASYLUM.—Junior Assistant Physician. Salary £140 per annum, with board, lodging, and laundry.

BARROW-IN-FURNESS, NORTH LONSDALE HOSPITAL.—Senior and Junior House Surgeon, unmarried. Salary £100 per annum each, with board, residence, and washing.

BATH, ROYAL UNITED HOSPITAL.—House Surgeon. Salary £80 per annum, with board, lodging, and washing.

BELGRAVE HOSPITAL FOR CHILDREN, Clapham-road, S.W.—House Physician and House Surgeon. Salaries at rate of £75 per annum, with board, residence, &c.

BETHNAL GREEN INFIRMARY AND WORKHOUSE, Cambridge Heath, E.—Assistant Medical Officer. Salary at rate of £100 per annum, with apartments, board, and washing.

BIRMINGHAM CITY ASYLUM, Rubery Hill.—Junior Assistant Medical Officer. Salary £200 per annum, with apartments, board, laundry, &c.

BIRMINGHAM CITY FEVER HOSPITAL, Little Bromwich.—Assistant Medical Officer. Salary £150 per annum, with board and residence.

BRADFORD CHILDREN'S HOSPITAL.—House Surgeon. Salary £100 per annum.

BRADFORD POOR-LAW UNION HOSPITAL AND WORKHOUSE.—Assistant Resident Medical Officer, unmarried. Salary £130 per annum, with rations, apartments, and laundry.

BRIGHTON, ROYAL SUSSEX COUNTY HOSPITAL.—Assistant House Surgeon, unmarried. Salary £80 per annum, with apartments, board, and laundry.

BRIGHTON THROAT AND EAR HOSPITAL, Church-street, Queen's-road.—Non-resident House Surgeon for six months. Salary at rate of £100 per annum.

BRISTOL ROYAL INFIRMARY.—Three House Surgeons and One House Physician. Salaries at rate of £100 per annum. Also Throat, Nose, and Ear House Surgeon. Salary at rate of £75 per annum. All with apartments, board, and laundry, and for six months.

BUENOS AYRES, BRITISH HOSPITAL.—Senior Resident Medical Officer and Assistant Resident Medical Officer, unmarried. Salary £275 and £250 per annum respectively, with board and lodging.

BURY INFIRMARY.—Junior House Surgeon. Salary £80 per annum, with board, residence, and washing.

CANTERBURY MENTAL HOSPITAL, Canterbury.—Assistant Medical Officer, unmarried. Salary £200 per annum, with board, lodging, washing, and attendance.

CARDIFF, KING EDWARD VII.'S HOSPITAL.—House Surgeon for six months. Salary at rate of £60 per annum, with board, residence, and laundry.

CARDIFF, KING EDWARD VII. WELSH NATIONAL MEMORIAL ASSOCIATION.—Assistant Tuberculosis Physicians. Salary £300 per annum.

CENTRAL LONDON OPHTHALMIC HOSPITAL, Judd-street, St. Pancras, W.C.—House Surgeon. Salary at rate of £50 per annum, with board and residence.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST, Victoria Park, E.—Resident Medical Officer. Salary £150 per annum, with board, &c.

CITY OF LONDON LYING-IN HOSPITAL, City-road, E.C.—Resident Medical Officer for four months. Salary at rate of £50 per annum, with board, lodging, and washing.

COLCHESTER, ESSEX COUNTY HOSPITAL.—House Surgeon. Salary £100 per annum, with board, washing, and residence.

DORCHESTER, DORSET COUNTY HOSPITAL.—House Surgeon, unmarried. Salary £100 per annum, with board and residence.

DUMFRIES AND GALLOWAY ROYAL INFIRMARY.—Assistant House Surgeon. Salary £65 per annum, with board and washing.

DURHAM COUNTY ASYLUM.—Third and Fourth Assistant Medical Officers, unmarried. Salary £200 per annum, with board, lodging, and washing.

EAST LONDON HOSPITAL FOR CHILDREN AND DISPENSARY FOR WOMEN, Shadwell, E.—House Surgeon for six months. Salary at rate of £75 per annum, with board, residence, and laundry.

ENNISKILLEN, FERMANAGH COUNTY HOSPITAL.—House Surgeon. Salary £72 per annum.

EVELINA HOSPITAL FOR SICK CHILDREN, Southwark, London, S.E.—Ten Clinical Assistants in Out-patient Departments.

EXMINSTER, DEVON COUNTY ASYLUM.—Junior Assistant Medical Officer. Salary £200 per annum, with quarters, board, and laundry.

FARRINGDON GENERAL DISPENSARY AND LYING-IN CHARITY, 17, Bartlett's-buildings, Holborn Circus, E.C.—Honorary Physician.

GARTLOCH MENTAL HOSPITAL, Gartcosh, near Glasgow.—Directorship of the Scottish Western Asylums' Research Institute.

GLOUCESTER, GLOUCESTERSHIRE ROYAL INFIRMARY AND EYE INSTITUTION.—Assistant Physician.

HALIFAX ROYAL INFIRMARY.—Second House Surgeon, unmarried. Salary £100 per annum, with residence, board, and washing. Also Third House Surgeon, unmarried. Salary £80 per annum, with residence, board, and washing.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.—IN-PATIENTS' DEPARTMENT, Haverstock-hill: House Physician and House Surgeon for six months. Salaries at rate of £70 per annum, with board, residence, and laundry. CAMDEN TOWN OUT-PATIENTS' DEPARTMENT: Resident Casualty Officer. Salary £140 per annum, with board, residence, and laundry. Also Assistant Casualty Officer for six months. Salary at rate of £60 per annum, with board, residence, and laundry.

HASTINGS, EAST SUSSEX HOSPITAL.—Assistant House Surgeon. Salary at rate of £70 per annum, with residence, board, and washing.

HEMEL HEMPSTEAD, WEST HERTS HOSPITAL.—Resident Medical Officer. Salary £100 per annum, with rooms, board, and washing.

HOLBORN UNION INFIRMARY, Upper Holloway, N.—Second Assistant Medical Officer. Salary £100 per annum, with board, apartments, and washing.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—Resident Medical Officer, unmarried. Salary £200 per annum, with board and residence.

HULL ROYAL INFIRMARY.—House Physician, unmarried. Also Assistant House Surgeon. Salary £100 per annum in each case, with board and lodging.

KENT COUNTY COUNCIL.—Tuberculosis Officer. Salary at rate of £500 per annum.

KETTERING AND DISTRICT GENERAL HOSPITAL.—Resident Medical Officer, unmarried. Salary £100 per annum, with board, residence, &c.

KING'S COLLEGE HOSPITAL.—Resident Assistant Clinical Pathologist. Salary £60 per annum, with board and lodging.

LEAMINGTON, WARNEFORD, LEAMINGTON, AND SOUTH WARWICKSHIRE GENERAL HOSPITAL.—House Physician. Salary £35 per annum, with board, residence, and laundry.

LEEDS PUBLIC DISPENSARY.—Junior Resident Medical Officer. Salary £100 per annum, with board, residence, and laundry.

LEEDS UNIVERSITY.—Research Assistant in Department of Pathology. Salary £150 per annum.

LEICESTER ROYAL INFIRMARY.—Assistant House Surgeon for six months. Salary at rate of £80 per annum, with board, apartments, and washing.

LIVERPOOL, CITY OF.—Assistant Tuberculosis Officer. Salary at rate of £400 per annum.

LIVERPOOL EDUCATION COMMITTEE.—School Medical Officer. Salary £250 per annum.

LIVERPOOL STANLEY HOSPITAL.—Senior Resident Officer. Salary £125 per annum, with board, residence, and laundry.

LONDON HOMŒOPATHIC HOSPITAL, Great Ormond-street, and Queen-square, W.C.—Resident Medical Officers. Salary at rate of £80 per annum, with board, apartments, and laundry.

MACCLESFIELD GENERAL INFIRMARY.—Senior House Surgeon and Junior House Surgeon. Salary £100 and £80 per annum respectively, with board and residence.

MANCHESTER CHILDREN'S HOSPITAL, OUT-PATIENTS' DEPARTMENT, Gartside-street, Manchester.—Assistant Medical Officer for six months. Salary £100 per annum.

MANCHESTER EAR HOSPITAL, Grosvenor-square, Oxford-road, Manchester.—Honorary Assistant Surgeon.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Parkplace, Cheetham Hill-road.—House Surgeon. Salary £120 per annum, with apartments and board.

MANCHESTER ROYAL INFIRMARY.—Resident Surgical Officer, unmarried. Salary £150 per annum, with board and residence.

MANCHESTER WORKHOUSE, Crumpsall.—Junior Resident Assistant Medical Officer, unmarried. Salary £110 per annum, with rations, apartments, washing, attendance, &c.

MARGARET-STREET HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, 26, Margaret-street, Cavendish-square, W.—Honorary Laryngologist.

METROPOLITAN WATER BOARD.—District Medical Officers.

MIDDLESBROUGH. NORTH ORMESBY HOSPITAL.—Assistant House Surgeon. Salary at rate of £90 per annum for first six months and £100 per annum afterwards, with board, apartments, washing, and attendance.

MIDDLESBROUGH, NORTH RIDING INFIRMARY.—Senior House Surgeon. Salary at rate of £100 per annum for first six months, with board, residence, and laundry.

MONMOUTHSHIRE EDUCATION COMMITTEE.—Third Assistant Medical Officer. Salary £250 per annum.

NATIONAL HEALTH INSURANCE COMMISSION (ENGLAND).—Medical Officers. Salary £500 per annum.

NEWARK-UPON-TRENT HOSPITAL.—Resident Medical Officer, unmarried. Salary £100 per annum, with board, lodging, and laundry.

NEWCASTLE-UPON-TYNE DISPENSARY.—Visiting Medical Assistants. Salary £200 per annum.

NORFOLK EDUCATION COMMITTEE.—Assistant Medical Officer. Salary £250 per annum.

NORTHAMPTONSHIRE COUNTY COUNCIL EDUCATION COMMITTEE.—Assistant School Medical Officer. Salary £250 per annum.

NOTTINGHAM WORKHOUSE AND INFIRMARY.—Resident Assistant Medical Officer, unmarried, for six months. Salary at rate of £165 per annum, with apartments, board, attendance, and washing.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL HOSPITAL.—House Physician for six months. Salary £75 per annum, with board, residence, and washing.

ROCHDALE INFIRMARY.—Second House Surgeon, unmarried. Salary £100 per annum, with board, residence, and laundry.

ROYAL LONDON OPHTHALMIC HOSPITAL, City-road, E.C.—Senior House Surgeon. Salary £100 per annum, with board and residence.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL.—Surgical Registrar. Salary £105 per annum. Also Resident House Surgeon, unmarried, for six months. Salary £100 per annum, with board, residence, and washing.

ST. GILES, CAMBERWELL, INFIRMARY, Brunswick-square, Camberwell.—Assistant Medical Officer. Salary £150 per annum, with apartments, board, and washing.

ST. MARY'S HOSPITAL FOR WOMEN AND CHILDREN, Plaistow, E.—Junior Resident Medical Officer, unmarried, for seven months. Salary at rate of £70 per annum, with residence, board, and laundry.

SALFORD UNION INFIRMARY.—Resident Assistant Medical Officer, unmarried. Salary £120 per annum, with apartments, attendance, and rations.

SAMARITAN FREE HOSPITAL FOR WOMEN, Marylebone-road, N.W.—Resident House Surgeon. Salary £80 per annum, with board and residence.

SEAMEN'S HOSPITAL SOCIETY.—DREADNOUGHT HOSPITAL, Greenwich: Two House Physicians and Two House Surgeons. Salary £50 per annum each, with board, residence, and washing. ALBERT DOCK HOSPITAL, Connaught-road, E.: House Surgeon; also House Surgeon to Out-patients. Salary £75 per annum each, with board, residence, and washing. All for six months.

SHEFFIELD UNION HOSPITAL, Firvale.—Resident Assistant Medical Officer, unmarried. Salary £120 per annum, with apartments, rations, &c.

SOUTHAMPTON, ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL.—House Physician. Salary at rate of £100 per annum, with rooms, board, and washing.

SWANSEA GENERAL AND EYE HOSPITAL.—House Surgeon. Salary £100 per annum, with board, washing, and attendance.

VENTNOR, ROYAL NATIONAL HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST ON THE SEPARATE PRINCIPLE.—Assistant Resident Medical Officer, unmarried. Salary £100 per annum, with board, lodging, &c.

WAKEFIELD GENERAL HOSPITAL.—Second House Surgeon, unmarried. Salary £100 per annum, with board, lodging, and washing.

WARRINGTON INFIRMARY AND DISPENSARY.—Junior House Surgeon for six months. Salary at rate of £120 per annum, with apartments, maintenance, and laundry.

WARRINGTON, LANCASHIRE COUNTY ASYLUM, Winwick.—Assistant Medical Officer. Salary £200 per annum, with board, apartments, attendance, and washing. Also Locum Tenens Medical Officer.

WARRINGTON UNION.—Assistant Resident Medical Officer. Salary £150 per annum, with apartments, rations, &c.

WEST BROMWICH AND DISTRICT HOSPITAL.—Assistant Resident House Surgeon and Anæsthetist, unmarried. Salary £75 per annum, with board, residence, and washing.

WEST HAM BOROUGH ASYLUM, Goodmayes, Ilford.—Junior Assistant Medical Officer, unmarried. Salary £200 per annum, with apartments, board, washing, and attendance.

WEST HAM AND EASTERN GENERAL HOSPITAL, Stratford, E.—Junior House Surgeon. Salary at rate of £75 per annum.

WIGAN, ROYAL ALBERT EDWARD INFIRMARY AND DISPENSARY.—Junior House Surgeon. Salary £100 per annum, with rations, apartments, and washing.

WINDSOR, KING EDWARD VII. HOSPITAL FOR WINDSOR, ETON, AND DISTRICT.—Second House Surgeon. Salary £75 per annum, with residence, board, laundry, and attendance.

YORK DISPENSARY AND MATERNITY HOSPITAL.—Resident Medical Officer, unmarried. Salary £140 per annum, with board, lodging, and attendance.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies as Certifying Surgeons under the Factory and Workshop Acts at Passage, in the county of Cork; at Wigton, in the county of Cumberland; and at Dursley, in the county of Somerset.

Births, Marriages, and Deaths.

BIRTHS.

CAWSTON.—On Sept. 14th, at Brecon House, Wantage, the wife of A. E. Cawston, M.R.C.S., L.R.C.P., of a daughter.

HARDIE.—On Sept. 14th, at Wood-street, Barnet, the wife of Charles F. Hardie, M.A., M.B., of a son.

MARRIAGES.

HUTCHINSON—WHITTAKER.—On Saturday, Sept. 6th, at Christ Church, Surbiton, Surrey, by the Rev. R. Swainson, Richard Cecil Hutchinson, M.B., Ch.B., D.P.H., of Carmarthen, South Wales, to Gwendoline Mary Bushnell Whittaker, niece of the late Alfred and Mrs. Geary, late of Kingston Hill.

DEATHS.

ALLEN.—On August 13th, at 211, Commercial-road, Pietermaritzburg, Natal, James Franklin Allen, M.D. R.U.I., M.Ch.

TENNENT.—On Sept. 13th, at Bath-street, Glasgow, Gavin Paterson Tennent, M.D.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

THE PRICE OF POPULARITY.

OUR Special Commissioner in making his investigations in different parts of the United Kingdom has often alluded to the position of a practitioner who, having gone on to the panel, found his *clientèle* so huge as to be embarrassing. His plight is depicted in the accompanying sketch with pardonable exaggeration by the adroit and well-known pen of Mr. Atkinson, who has given the original of our reproduction to Miss Alice Browne to be sold for the benefit of the Royal Medical Benevolent Fund Guild.

—*POPULARITY!*

The work of that Guild, to which frequent allusion has been made in our columns, is so good that we hope to learn that Miss Browne (who may be addressed at 76, South Side, Clapham Common, S.W.) has received a good price for Mr. Atkinson's drawing. The *Pall Mall Gazette* recently contained a story relating to a practitioner who had gone on the panel, and whose public repute was such that he had to institute an "early door"; Mr. Atkinson's admirable drawing suggests that such a move might be needed in some instances.

CLIMATE AND DISEASES OF GERMAN EAST AFRICA.

A SOMEWHAT extended report on this subject, covering the years 1909–12, was recently received at the Foreign Office from Mr. Vice-Consul Norman-King, and has now been presented to both Houses of Parliament. From this it appears that according to Government official returns the total native population on Jan. 1st, 1912, was 7,495,800; the coloured population (other than native), 14,933; and the white population, 4866. Of the latter, 3579 were of German nationality, 123 were British, and 268 were British colonial subjects (principally Boers). The district of Moschi contains most British subjects—46 British and 234 Boers.

The climate (the report states) on the coast, where the air is heavily charged with moisture, is hot and enervating. There is always a certain amount of fever, and the coast towns cannot be regarded as satisfactory places of permanent residence for Europeans. The highlands in the interior are, however, for the most part healthy. The nights are always cool, and in some places mosquito nets can be dispensed with. At the same time some of the favourite districts for European settlement are not free from reproach. Malaria exists in the Kilimandjaro-Meru district; and in Leganga—the centre of the settlement district of the Kolonial Gesellschaft, which is 4500 feet above sea level—malaria is endemic. On several of the European rubber plantations which appear to enjoy an immunity from mosquitoes cases of fever are frequent. The diseases most dangerous to Europeans are malaria, blackwater fever, and dysentery. The mortality among Europeans was 2·18 per cent. in 1908–09, 2·53 in 1909–10, and 2·08 in 1910–11. Of the 89 Europeans who died in the Protectorate in 1910, 12 died from malaria, 14 from blackwater fever, and 4 from dysentery.

There are excellent hospitals for Europeans at Dar-es-Salaam and Tanga under the supervision of Government medical officers and trained nurses. There are also hospitals for natives at the same places. The Sewa Haji Hospital at Dar-es-Salaam was founded in 1893 by an Indian for coloured patients. There are Government sanatoriums at Wugiri, in West Usambara, and at Amani. The principal diseases affecting the native population are small-pox, chicken-pox, worm diseases, and malaria. Systematic vaccination is being carried out by the Government. A serious outbreak of small-pox occurred among the labourers at the railhead of the Central Railway near Morogoro in 1909. The disease spread rapidly over a wide area; 1114 cases occurred with 376 deaths. Its further spread was prevented by the Government's energetic measures, and 892,842 natives were vaccinated in 1909. About 800,000 were vaccinated in 1910, and only 139 cases occurred in that year. Worm disease is being energetically combated by means of the thymol treatment and by systematic instruction of whites and natives alike on the importance of hygienic conditions.

Owing to the comparatively dry seasons which have prevailed lately, malaria, which with recurrent fever and dysentery is always endemic, did not come to any serious outbreak among the native population. The Government is doing much to check the progress of malaria at Dar-es-Salaam and Tanga by distributing quinine to the natives and by energetic measures to destroy the mosquitoes. Small outbreaks of plague have occurred in recent years, and the destruction of rats is being carried out systematically; over 60,000 were destroyed in 1910. Sleeping sickness probably entered German East Africa from British or Congolese territory, and its spread caused grave anxiety to the Government. The form of the disease related to glossina palpalis occurs in three districts—in the Bukoba and Muansa districts, on the shores of Victoria Nyanza, and on the east coast of Tanganyika. An outbreak of the Rhodesia form of sleeping-sickness transmitted by glossina morsitans, and doubtless introduced from Portuguese territory, occurred in the southern districts of the Protectorate in 1912; 51 cases were treated. It is believed that the medical authorities have got the disease well under control in the districts near Victoria Nyanza. In the Tanganyika district much is being done by treating the natives with atoxyl, by the organisation of segregation camps, and by destroying the vegetation and the reptiles which harbour the dangerous fly.

The opening up of the interior has enabled the authorities to take measures to combat leprosy. Lepers are isolated in Government stations, where they receive free food and (twice yearly) free clothing. As far as possible these stations are spread over the

various districts where leprosy prevails in order that the unfortunate victims may not be taken farther than necessary from their homes. The existence of typhus abdominalis among the native population was conclusively proved in 1909. Several cases were observed in 1910 and 1911, but the disease nowhere occurred as an epidemic. In the latter part of 1912 a serious outbreak of cholera occurred among the native population in the island of Zanzibar. Strict quarantine measures were at once imposed at all the German East African ports, and the disease did not gain a foothold in the Protectorate. Quarantine was not abolished until February, 1913.

In general, it may be said that the native population is on the increase. This increase may be ascribed to the suppressing of tribal feuds by the Government, support in time of famine, and the work of sanitary and medical authorities. The comparatively small number of children is to be attributed less to the habit of early marriage than to infant mortality due to insufficient nourishment. In some of the districts of the interior the complaint is heard that the natives who leave homes to work on distant plantations lose all inclination for family and home life, but how far this is detrimental to the increase of the population has not yet been established.

REX *v.* HAMILTON.

To the Editor of THE LANCET.

SIR,—Having heard the whole of the evidence given in the case against Dr. Hamilton, of Essex House, Barnes, which collapsed to-day, I write to say that unless the Crown indicts four of the female witnesses for conspiracy there is no security or protection whatever for medical practitioners having legal custody of certified lunatics or receiving in their houses neurasthenic patients for curative treatment.

I am, Sir, yours faithfully,

Central Criminal Court, Sept. 11th, 1913. EDWARD ATKIN.

BIOLOGICAL APPARATUS.

A VERY interesting series of new biological apparatus (microtomes, drying machines, incubators, Wassermann baths, centrifuges) is described in a catalogue recently issued by Messrs. Charles Hearson and Co., of 235, Regent-street, London, W. Worthy of special mention is a centrifuge designed by Professor Sheridan Delépine. This is of English make throughout, and the rotor, buckets, and tubes are constructed of duralumin, an aluminium alloy having the strength of steel and yet which is light and proof against corrosion. The new Wassermann vaccine bath has the advantage of being fitted with the Hearson capsule, which affords a complete automatic control of the temperature. The catalogue includes an improved two-jet water-driven centrifuge constructed on lines suggested by Dr. C. J. Martin, of the Lister Institute. The speed varies, of course, with the pressure, but at a pressure of 10 lb. the number of revolutions is 1125 per minute, while at 70 lb. pressure the revolutions are 5625 per minute. The revolving plate carries four 10 c.c. and four 2 c.c. tubes, the latter being introduced for the purpose of "centrifuging" blood.

A LITTLE PROBLEM.

To the Editor of THE LANCET.

SIR,—I have a patient at the seaside. He is living, say, four miles (at any rate the *bonâ-fide* distance) from a certain hotel at which I arranged to meet him yesterday (Sunday) at 4 P.M. I was living for the week-end with a friend two miles on the other side of the hotel. It was important that I should see my patient. There was no question about his right to admission, but they blankly refused me—by law. He could come by conveyance to the rendezvous; I had to walk. They would not allow me into even the garden, notwithstanding that I explained everything. It appeared to me peculiar. It is therefore I ask if this refusal was right. I am, Sir, yours faithfully,

Great St. Helen's, E.C., Sept. 15th, 1913. H. CAMERON GILLIES.

*** It seems to us that the law did give the proprietor of the hotel a discretion to act as described.—ED. L.

HEALTH AND CLIMATE OF TEXAS.

AN official report by Mr. C. A. S. Perceval, British Consul at Galveston, U.S.A., states that an epidemic of cerebro-spinal meningitis, which made its appearance in Central Texas in the autumn of 1911 and spread to the coast in February, 1912, was the cause of several hundred deaths in the early part of the latter year. It disappeared during the month of May with the advent of warm weather. With this exception the general health was good during 1912. The leading cause of death in Texas is tuberculosis of the lungs, pneumonia being second. The Texas State Board of Health is making an investigation in order to determine the prevalence of hookworm disease among the rural and semi-urban residents of East Texas. In seven counties 48 per cent. of those of all ages examined were found to be infected, while the percentage among the school children was higher. Endeavours are being made to eradicate this disease. The climatic conditions in Texas are excellent for those who dislike cold weather. There is naturally considerable variation between the climate of the northern part of the State and that of the south, which is almost tropical. Winters in the coast districts in which more than three or four frosts occur are rare. The summers are very long in Texas. In the interior temperatures above 100° F. in the shade are frequently experienced in June, July, and August, and sometimes in other months as well.

Suffolk Doctor.—The "Solmedia" produced by Chopping, of Westminster, referred to in THE LANCET of Sept. 6th, p. 744, can be obtained from Messrs. Baird and Tatlock, Hatton Garden, E.C.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

Medical Diary for the ensuing Week.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

LONDON HOSPITAL MEDICAL COLLEGE (UNIVERSITY OF LONDON), Clinical Theatre, London Hospital, Mile End-road, E.

Demonstrations in Clinical Medicine:—

MONDAY.—2.15 P.M., Dr. Wall: Pulmonary Tuberculosis.
TUESDAY.—2.15 P.M., Dr. Grünbaum: Diseases of the Blood.
WEDNESDAY.—2.15 P.M., Dr. Hutchison: Diagnosis of Abdominal Disease.—Dr. Thompson: Diseases of the Ductless Glands.
THURSDAY.—2.15 P.M., Dr. Head: Mental Symptoms occurring in the Practice of General Medicine.
FRIDAY.—2.15 P.M., Dr. L. Smith: Common Cardiac Conditions.

Demonstrations on Selected Surgical Cases and on Cases of Interest in the Wards of the Hospital:—

MONDAY.—10.30 A.M., Mr. R. Howard.
TUESDAY.—2 P.M., Mr. Lett.
WEDNESDAY.—2 P.M., Mr. Warren.
THURSDAY.—2 P.M., Mr. R. Milne.
FRIDAY.—2 P.M., Mr. Walton.

THE THROAT HOSPITAL, Golden-square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

EDINBURGH POST-GRADUATE COURSES IN MEDICINE (IN CONNEXION WITH THE UNIVERSITY AND ROYAL COLLEGES).

MONDAY.—9 A.M., Obstetrical Clinic (at the Royal Maternity Hospital); Refraction (at the Royal Infirmary); Operative Surgery (at the University). 10 A.M., Neurology (at the Royal Infirmary); Operative Surgery (at the University). 11 A.M., Dermatology, Post-mortems, Genito-urinary Surgery (at the Royal Infirmary); 12 noon, Surgical Clinic (at the Royal Hospital for Sick Children); Genito-urinary Surgery (at the Royal Infirmary). 2 P.M., Bacteriology, Surgical Anatomy (at the University). 3.30 P.M., Hæmatology, Surgical Pathology, Histological Methods (at the University). 5 P.M., Special Lecture (at the University). 6 P.M., Infant Feeding (at the University); Gynecological and Obstetric Pathology.

TUESDAY.—9 A.M., Refraction (at the Royal Infirmary); Operative Surgery (at the University). 10 A.M., Neurology, Gynecology (at the Royal Infirmary); Operative Surgery (at the University). 11 A.M., Medical Clinic, Surgical Out-patients, Post-mortems, Gynecology (at the Royal Infirmary); Operations (at the Royal Hospital for Sick Children); Genito-urinary Surgery (at the Royal Infirmary). 12 noon, Medical Clinic (at the Royal Hospital for Sick Children); Diseases of Eye, Genito-urinary Surgery (at the Royal Infirmary). 2 P.M., Bacteriology, Surgical Anatomy (at the University). 3.30 P.M., Tropical Diseases, Surgical Pathology, Histological Methods (at the University). 5 P.M., Radium Therapy (at the Royal Infirmary). 6 P.M., Infant Feeding (at the University); Gynecological and Obstetric Pathology.

WEDNESDAY.—9 A.M., Obstetric Clinic (at the Royal Maternity Hospital); Refraction (at the Royal Infirmary); Operative Surgery (at the University). 10 A.M., Neurology (at the Royal Infirmary); Operative Surgery (at the University). 11 A.M., Dermatology, Post-mortems, Genito-urinary Surgery (at the Royal Infirmary). 12 noon, Surgical Clinic, Genito-urinary Surgery (at the Royal Infirmary). 2 P.M., Bacteriology, Surgical Anatomy (at the University). 3.30 P.M., Hæmatology, Surgical Pathology, Histological Methods (at the University). 5 P.M., Special Lecture. 6 P.M., Infant Feeding (at the University); Gynecological and Obstetric Pathology.

THURSDAY.—9 A.M., Refraction (at the Royal Infirmary); Operative Surgery (at the University). 10 A.M., Neurology, Gynecology (at the Royal Infirmary); Operative Surgery (at the University). 11 A.M., Medical Clinic, Surgical Out-patients, Post-mortems, Gynecology (at the Royal Infirmary); Operations (at the Royal Hospital for Sick Children); Genito-urinary Surgery (at the Royal Infirmary). 12 noon, Medical Clinic (at the Royal Hospital for Sick Children); Diseases of Eye, Genito-urinary Surgery (at the Royal Infirmary). 2 P.M., Bacteriology, Surgical Anatomy (at the University). 3.30 P.M., Tropical Diseases, Surgical Pathology, Histological Methods (at the University). 5 P.M., Radium Therapy (at the Royal Infirmary). 6 P.M., Infant Feeding (at the University); Gynecology and Obstetric Pathology.

FRIDAY.—9 A.M., Obstetric Clinic (at the Royal Maternity Hospital); Refraction (at the Royal Infirmary); Operative Surgery (at the University). 10 A.M., Neurology (at the Royal Infirmary); Operative Surgery (at the University). 11 A.M., Dermatology, Post-mortems, Genito-urinary Surgery (at the Royal Infirmary). 12 noon, Surgical Clinic, Genito-urinary Surgery (at the Royal Infirmary). 2 P.M., Bacteriology, Surgical Anatomy (at the University). 3.30 P.M., Hæmatology, SurgicalPathology, Histological Methods (at the University). 5 P.M., Special Lecture. 6 P.M., Infant Feeding (at the University); Gynecological and Obstetric Pathology.

SATURDAY.—9 A.M., Tropical Diseases (at the University); 10 A.M., Fevers (at the City Hospital); Gynecology (at the Royal Infirmary). 11 A.M., Gynecology (at the Royal Infirmary).

ROTUNDA HOSPITAL POST-GRADUATE COURSES, Dublin.

MONDAY.—10 A.M., Obstetrical Lecture: Pubiotomy and Symphysiotomy (continued). 11 A.M., Examination of Patients and Minor Operations.
TUESDAY.—10 A.M., Major Operations.
WEDNESDAY.—10 A.M., Obstetrical Lecture: Operations involving the Destruction of the Foetus. 11 A.M., Examination of Patients and Minor Operations.
THURSDAY.—10 A.M., Major Operations.
FRIDAY.—10 A.M., Gynæcological Lecture: Uterine Tumours (Malignant) (continued). 11 A.M., Examination of Patients and Minor Operations.

For further particulars of the above Lectures, &c., see Advertisement Pages.

A DIARY OF CONGRESSES.

WE shall publish this diary from time to time that our readers may have under their hands the dates of the approaching scientific Congresses. It is unnecessary to issue the lists of all these functions week by week, and we propose to make only such gatherings as will occur in the immediate future the subject of regular announcement. The following Congresses, Conferences, and Exhibitions are announced:—

April 28th–Nov. 5th (Ghent).—International Exhibition.
May 31st to October (London, Earl's Court).—Imperial Services Exhibition.
May–October (Leipzig).—First International Building Exhibition.
June–October (London, Crystal Palace).—Anglo-German Exhibition.
June 24th–Sept. 30th (London, 54a, Wigmore-street).—Historical Medical Museum. (Organised by Mr. Henry S. Wellcome.)
Sept. 21st–28th (Vienna).—Eighty-fifth Meeting of German Natural Philosophers and Physicians.
,, 22nd–28th (Milan).—Fourteenth International Anti-alcoholic Congress.
,, 30th–Oct. 3rd (Southampton).—Church Congress.
Oct. 1st (London, Shepherd's Bush).—National Gas Exhibition.
,, 28th–Nov. 1st (London, Royal Horticultural Hall).—Twenty-fourth Universal Cookery and Food Exhibition.
(Chicago).—Congress of the International Association of Refrigeration.
(Washington).—Congress of American Physicians and Surgeons.

In 1914:—

April 14th–18th (New York).—Fourth Congress of the International Surgical Society.
May 1st–Nov. 1st (Lyons).—International Town Life Exhibition.
Aug. 3rd–8th (London).—Sixth International Dental Congress.
,, 10th–15th (St. Petersburg).—Twelfth International Congress of Ophthalmology.
Sept. 7th–12th (Berne).—International Congress for Neurology, Psychiatry, and Psychology.
September (Vienna).—Third International Congress for Diseases of Occupation.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Sept. 17th, 1913.

Date.	Bar. mets reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radiation in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Sept. 11	30·17	W.	...	106	69	53	55	57	Fine
,, 12	29·85	W.	...	115	69	57	60	62	Cloudy
,, 13	29·51	WSW	...	108	69	56	58	59	Misty
,, 14	29·34	S.	0·05	110	71	54	56	60	Fine
,, 15	29·50	S.E.	0·07	107	65	52	54	56	Fine
,, 16	29·63	S.E.	0·03	102	66	48	54	55	Fine
,, 17	29·57	S.W.	0·39	93	67	53	54	54	Overcast

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial Staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used.

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index and Title-page to Vol. I. of 1913, which was completed with the issue of June 28th, were given in THE LANCET of July 5th.

VOLUMES AND CASES.

VOLUMES for the first half of the year 1913 are now ready. Bound in cloth, gilt lettered, price 16*s.* carriage extra.

Cases for binding the half-year's numbers are also ready. Cloth, gilt lettered, price 2*s.*, by post 2*s.* 3*d.*

To be obtained on application to the Manager, accompanied by remittance.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C., are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will insure regularity in the despatch of their journals and an earlier delivery than the majority of Agents are able to effect.

THE COLONIAL AND FOREIGN EDITION (printed on thin paper) is published in time to catch the weekly Friday mails to all parts of the world.

The rates of subscriptions, post free from THE LANCET Offices, have been reduced, and are now as follows:—

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TO COLONIAL AND FOREIGN SUBSCRIBERS.

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The Manager will be pleased to forward copies direct from the Offices to places abroad at the above rates, whatever be the weight of any of the copies so supplied.

SOLE AGENTS FOR AMERICA—Messrs. WILLIAM WOOD AND CO., 51, Fifth Avenue, New York, U.S.A.

The following journals, magazines, &c., have been received:—American Medicine, Jahrbuch für Kinderheilkunde und Physische Erziehung, Tuberculosis, British Journal of Dental Science, Archives of the Roentgen Ray, Medical Chronicle, British Journal of Children's Diseases, Maryland Medical Journal, Monthly Cyclopedia, Saint Paul Medical Journal, American Journal of Medical Sciences, Therapeutic Gazette, American Journal of Tropical Diseases and Preventive Medicine, Pediatrics, International Journal of Surgery, Archives of Pediatrics, St. Bartholomew's Hospital Journal, Medical Review, Bulletin of the Johns Hopkins Hospital, Northwestern University Bulletin, Journal of Surgery, Symons's Meteorological Magazine, South African Medical Record.

Communications, Letters, &c., have been received from—

A.—Ayr District Asylum, Medical Superintendent of; A. W. W. S.; Messrs. Allen and Hanburys, Lond.; Messrs. Adlard and Son, Lond.; Mr. Raymond E. Apperly, Lond.; Automobile Association and Motor Union, Lond.

B.—Bury Infirmary, Secretary of; Messrs. Burroughs, Wellcome, and Co., Lond.; Bedford County Hospital, Secretary of; Dr. J. Bernstein, Lond.; His Eminence Cardinal Bourne, Lond.

C.—Messrs. T. Cook and Son, Lond.; Clayton Hospital, Wakefield, Hon. Secretary of; Canterbury Mental Hospital, Clerk to the; Dr. R. Crawfurd, Lond.; Carlisle Dispensary, Secretary of; Messrs. J. and A. Churchill, Lond.; Dr. A. M. Corthorn, Lond.; Dr. G. H. Coke, Gatooma; Dr. R. Champion, Ballarat East; Chemische Fabrik Reisholz, Manager of; Camberwell Guardians, Lond., Clerk to the; Mr. Sydney W. Cole, Port Erroll; Dr. A. K. Chalmers, Glasgow; Mr. J. Jackson Clarke, Lond.; Mr. C. F. Clay, Lond.

D.—Devon County Asylum, Exminster, Clerk to the; Messrs. W. Dawson and Sons, Lond.; Mr. J. P. Davies, Cradley Heath; Duff House, Banff, Secretary of; Professor S. Delépine, Manchester; Dr. Dupuy, Paris; Durham County Asylum, Winterton, Clerk to the; D. A. B.; Mr. V. Dante, Parma; G. H. J. Day (Patents), Ltd., Oldham; Dr. H. A. Des Vœux, Charlbury; Messrs. Dale, Reynolds, and Co., Lond.; Denver Chemical Co.; Dumfries and Galloway Royal Infirmary, Secretary of; Derby, Medical Officer of Health of; Mr. J. C. Dodd, Liverpool; Mr. W. B. Dunne, Port of Nogales.

E.—Professor Ehrlich, Lond.; Essex and Colchester Lunatic Asylum, Brentwood, Medical Superintendent of; Dr. T. Bowman Edgar, Catrine.

F.—Dr. Fielden, Binn; Farringdon General Dispensary, Lond., Secretary of; Dr. S. B. Figgis, Brighton; Messrs. Fannin and Co., Lond.; Factories, Chief Inspector of, Lond.; Mr. F. Freyton, Püttlingen.

G.—Dr. C. C. Gibbes, Lond.; Dr. L. Guthrie, Lond.; Sir W. Gowers, Lond.; Grimsby and District Hospital, Secretary of; *Gazette Médicale de Paris*, Manager of; Dr. H. Cameron Gillies, Lond.; Mr. William Glenister, Stone; Dr. Frederick Gaertner, Pittsburgh; Glasgow, Medical Officer of Health of.

H.—Dr. C. O. Hawthorne, Lond.; Holborn Surgical Instrument Co., Lond.; Mr. J. Hart, Lond.; Mr. H. E. Haynes, Brentwood; Hoffmann-La Roche Chemical Works, Lond.; Hong-Kong, Principal Civil Medical Officer of; Dr. B. Hall, West Merses; Mr. W. G. Howarth, Lond.. Major L. W. Harrison, R.A.M.C., Lond.

J.—Mr. Edwin Jackson, Manchester.

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